KEYSHOT
Enhance your postproduction skillset with these pro tips

12GB OF FREE ASSETS
VIDEOS, HDRS, TEXTURES

www.3DArtistonline.com

3DArtist™

88

Practical inspiration for the 3D community

19 PAGE Disney PIXAR SPECIAL

ACHIEVE PIXAR QUALITY AT HOME

RENDERMAN

EXCLUSIVE PIXAR TUITION · VERSION 21 REVEALED · KEY FEATURES EXPLAINED
THE GOOD DINOSAUR UNCOVERED · FREE PIXAR DOWNLOAD

PHENOMENAL PHOTOREALISM
Create supercar renders that are indistinguishable from real life

MASTER MAYA LIGHTING
Use OctaneRender to develop an astonishing natural scene

ip IMAGINE PUBLISHING
DigitalEdition
GreatDigitalMags.com
ISSUE 088

ZBRUSH 4R7®
IMAGE COURTESY OF ANDREI ALEXANDROVICH
Pixologic
PIXOLOGIC.COM
THE ALL-IN-ONE DIGITAL SCULPTING SOLUTION.
DESIGNED FOR THE PURSUIT OF ART.

“As part of our research process, we tried to understand them as physical beings; to imagine ourselves in their bodies”

Mike Venturini on animating dinosaurs **Page 38**

19 PAGE
Disney PIXAR
SPECIAL

Render a photorealistic supercar **Page 42**

Welcome

To the magazine and 100 pages of amazing 3D

Welcome to **3D Artist**! RenderMan undeniably has a special place in our industry. Whether you're experiencing it on a large scale at the cinema, tinkering with it yourself at home or in the studio, or even queuing in the Teapot Line at SIGGRAPH, there's something magnetic about Pixar's famous rendering engine.

In this exciting issue, we've spoken to Pixar about how RenderMan has become the render engine of choice for many studios and how you can achieve Pixar quality yourself, whether at home or at work. Part of this is another exclusive Pixar tutorial that reveals how you can use RenderMan to upgrade a ZBrush workflow. We've also spent time with key personnel from The Good Dinosaur, who reveal the ins and outs of Disney Pixar's latest blockbuster.

Of course, as well as the four bitesize tutorials in our RenderMan feature, we've also put together another typically world-beating array of expert CG tutorials, including hyperrealism in 3ds Max, stunning lighting effects using Octane for Maya, an awesome interior arch-vis tutorial, dust effects using KeyShot and Photoshop, 3ds Max and V-Ray hair and fur techniques and a superb plane tracking and compositing masterclass in Blender. Have fun!

Steve Holmes, Editor

Sign up, share your art and chat to other artists at **www.3dartistonline.com**

Get in touch... 3dartist@imagine-publishing.co.uk @3DArtist Facebook.com/3DArtistMagazine

3D Artist

Imagine Publishing Ltd
Richmond House, 33 Richmond Hill
Bournemouth, Dorset BH2 6EZ
☎ +44 (0) 1202 586200
Web: www.imagine-publishing.co.uk
www.3dartistonline.com
www.greatdigitalmags.com

Magazine team

Editor Steve Holmes
stephen.holmes@imagine-publishing.co.uk
☎ 01202 586248
Editor in Chief Dan Hutchinson
Production Editor Carrie Mok
Photographer James Sheppard
Senior Art Editor Will Shum
Publishing Director Aaron Asadi
Head of Design Ross Andrews

Contributors
Murad Abujaish, Pablo Castaño, James Clarke, Vikrant Dalal, Andy Downes, Rainer Duda, Philippa Grafton, Alex Hoskins, Alexandre Jarek, Eric Keller, Sean Kennedy, Jude Leong, Daniele Orsetti, Reinier Reynhout, Sam Ribbits, Barbara Robertson, Dylan Sisson, Liam Warr

Advertising
Digital or printed media packs are available on request.
Head of Sales Hang Deretz ☎ 01202 586442
hang.deretz@imagine-publishing.co.uk
Account Manager Simon Hall ☎ 01202 586415
simon.hall@imagine-publishing.co.uk

FileSlio.co.uk
Assets and resource files for this magazine can be found on this website. Register now to unlock thousands of useful files. Support: filesilohelp@imagine-publishing.co.uk

International
3D Artist is available for licensing. Contact the International department to discuss partnership opportunities.
Head of International Licensing Cathy Blackman
☎ +44 (0) 1202 586401
licensing@imagine-publishing.co.uk

Subscriptions
To order a subscription to **3D Artist**:
☎ UK 0844 249 0472
☎ Overseas +44 (0) 1795 592951
Email: 3dartist@servicehelpline.co.uk
6-issue subscription (UK) – £21.60
13-issue subscription (UK) – £62.40
13-issue subscription (Europe) – £70
13-issue subscription (ROW) – £80

Circulation
Head of Circulation Darren Pearce ☎ 01202 586200

Production
Production Director Jane Hawkins ☎ 01202 586200

Finance
Finance Director Marco Peroni

Founder
Group Managing Director Damian Butt

Printing & Distribution
Printed by William Gibbons & Sons Ltd, 26 Planetary Road, Willenhall, West Midlands, WV13 3XT

Distributed in the UK, Eire & the Rest of the World by Marketforce, 5 Churchill Place, Canary Wharf, London E14 5HU
☎ 0203 787 9060, www.marketforce.co.uk

Distributed in Australia by Network Services (a division of Bauer Media Group), Level 21 Civic Tower, 66-68 Goulburn Street, Sydney, New South Wales 2000, Australia ☎ +61 2 8667 5288

Disclaimer
The publisher cannot accept responsibility for any unsolicited material lost or damaged in the post. All text and layout is the copyright of Imagine Publishing Ltd. Nothing in this magazine may be reproduced in whole or part without the written permission of the publisher. All copyrights are recognised and used specifically for the purpose of criticism and review. Although the magazine has endeavoured to ensure all information is correct at time of print, prices and availability may change. This magazine is fully independent and not affiliated in any way with the companies mentioned herein. If you submit material to Imagine Publishing via post, email, social network or any other means, you automatically grant Imagine Publishing an irrevocable, perpetual, royalty-free license to use the material across its entire portfolio, in print, online and digital, and to deliver the material to existing and future clients, including but not limited to international licensees for reproduction in international, licensed editions of Imagine products. Any material you submit is sent at your risk and, although every care is taken, neither Imagine Publishing nor its employees, agents or subcontractors shall be liable for the loss or damage.

© Imagine Publishing Ltd 2015

ISSN 1759-9636

IMAGINE PUBLISHING

recycle
When you have finished with this magazine please recycle it

"The fastest and easiest way to texture"
- Simon Fox, Blizzard

"Holy shit this is bad ass"
- David Lesperance, Valve

"An essential part of my pipeline"
- Josh Marlow, Epic

Quixel SUITE 2

OUT NOW

www.quixel.se

Scan based PBR painting. Straight in Photoshop.

The Expert Panel

This issue's team of pro artists...

REINIER REYNHOUT

reynhout.eu

Often you'll stumble across an artist that can just make anything look like a real object. Reinier is one of these people – we asked him to make a photorealistic car for us, and the result was astonishing.

3DArtist username reinier reynhout

ERIC KELLER

bloopatone.com

It's great to have Eric back on board this month. As per usual, he's put together a superb tutorial that combines ZBrush, Maya, NUKE and Octane to create a stunning natural scene.

3DArtist username bloopatone

ALEXANDRE JAREK

alexandrejarek.com

Alex has been on our radar for quite some time now, and from the quality of his arch-vis work you can see why! On p58 he explains his refined approach to luxury interior design in 3ds Max.

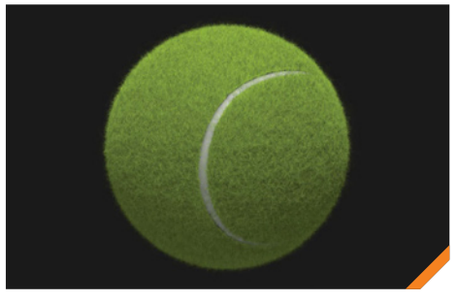
3DArtist username ajarek

PABLO CASTAÑO NORKUS

facebook.com/eletecedateando

Head over to p68 to discover the secrets behind creating convincing dust effects using KeyShot and Photoshop. Pablo has a real knack for creating weathered models, as you'll see.

3DArtist username Ltcdata



VIKRANT DALAL

project01studio.blogspot.in

Vikrant returns this month with another 3ds Max masterclass. This time out, he reveals a great technique for creating tennis ball fur using Max in conjunction with V-Ray.

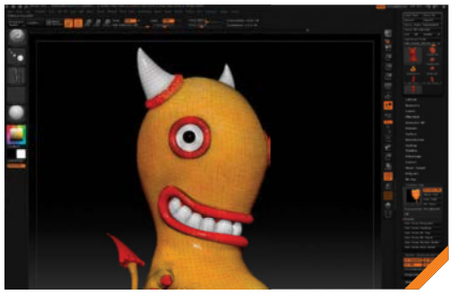
3DArtist username n/a

SEAN KENNEDY

openvisualfx.com

We had the pleasure of meeting Sean at SIGGRAPH back in August and can tell you that his passion for Blender is quite remarkable. On p76 he teaches you how to use Blender's compositing toolset.

3DArtist username hyperfx



DYLAN SISSON

renderman.pixar.com

As well as helping to explain the ins and outs of RenderMan in the present and its forthcoming updates, Dylan has also revealed how to use the renderer in conjunction with ZBrush on p27.

3DArtist username dylan.sisson

RAINER DUDA

rainer-d.eu

Rainer leapt at the chance to share his Houdini expertise yet again this month. On p30, discover how best to get yourself set up with the recently released RenderMan for Houdini.

3DArtist username Rainerd

DANIELE ORSETTI

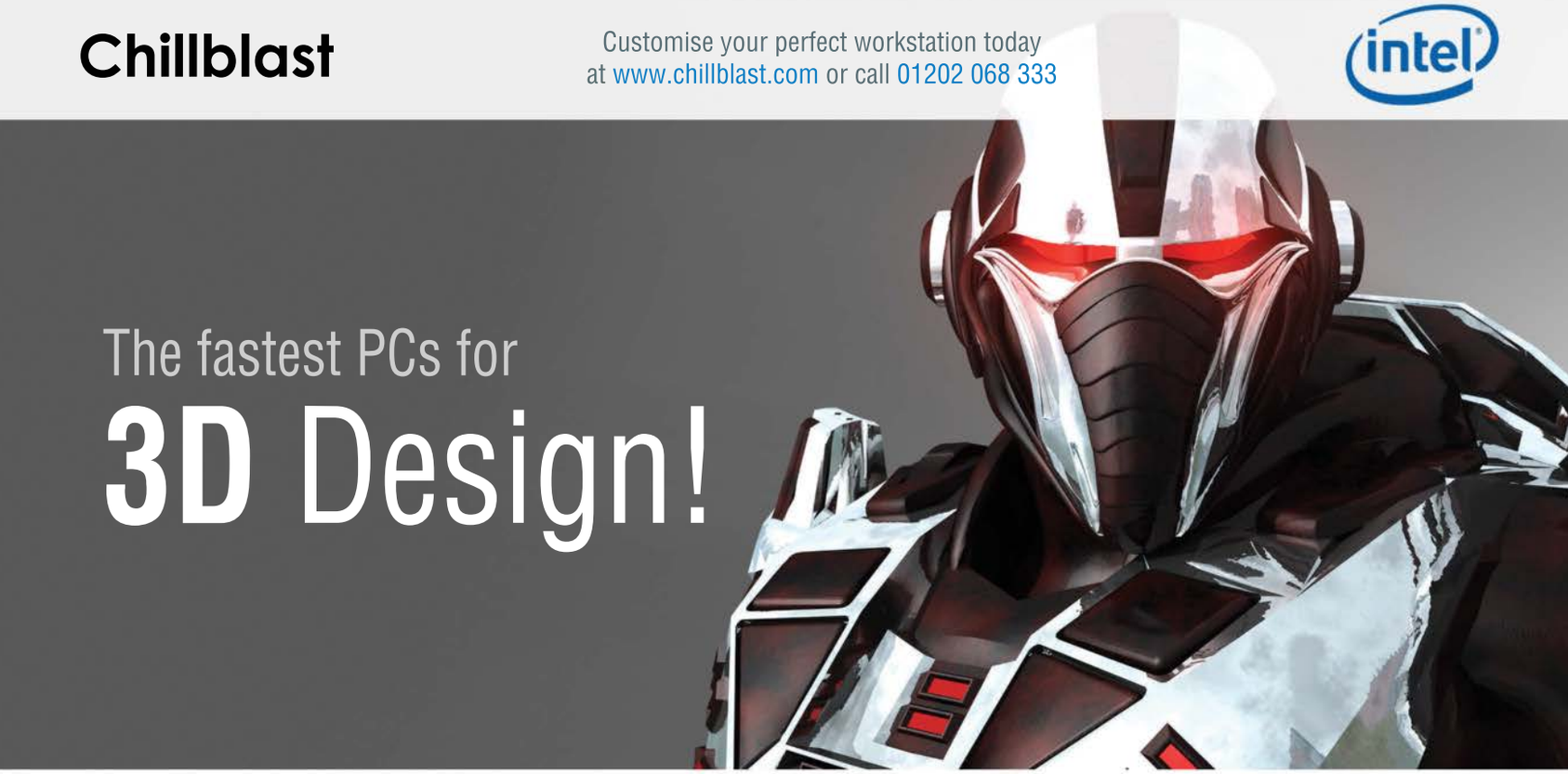
dayno.it

Following our in-depth look at the famous texture painter and its origins at Weta in issue 87, Daniele casts a critical, experienced eye over version 3.0 in his review on p82.

3DArtist username dayno

Chillblast

Customise your perfect workstation today
at www.chillblast.com or call 01202 068 333



The fastest PCs for
3D Design!

Fusion Render OC M4000

- Intel® Core™ i7-5820K Processor
- 32GB 2133MHz DDR4 Memory
- NVidia Quadro M4000 8GB (selection of cards available)
- 512GB Samsung M.2 PCIe SSD
- 2000GB Seagate Hard Disk Drive
- Blu-Ray ReWriter Drive
- Microsoft Windows 10 Professional

Just £2499 inc. VAT

Chillblast

7 TIME WINNER OF PC PRO EXCELLENCE AWARDS

Fusion Photo OC Lite II

Intel® Core™ i7-6700K Processor
16GB 2133MHz DDR4 Memory
NVidia GeForce GTX 750
128GB M.2 PCIe Solid State Drive
2x 1TB Hard Disks in RAID1
Blu-Ray ReWriter Drive
Microsoft Windows 10 Home

Just £1099 inc. VAT

Fusion Projection 3

Intel® Core™ i5-4690K Processor
16GB 1600MHz DDR3 Memory
NVidia Quadro K2200 4GB
128GB Samsung M.2 PCIe SSD
1000GB Hard Disk Drive
24x DVD-RW Drive
Microsoft Windows 10 Home

Just £1279 inc. VAT

Photo OC Mobile 15.6”

Intel® Core™ i7-4710MQ Processor
16GB 1600MHz DDR3 Memory
NVidia GeForce GTX 950M
120GB Samsung EVO mSATA SSD
1000GB Seagate Hybrid SSD/HDD
Blu-Ray ReWriter Drive
Microsoft Windows 10 Home

Just £1199 inc. VAT

£30 OFF
on Render OC, Photo OC Lite II, Projection 3 and Photo OC Mobile

Just use coupon code
3DOFFER1115

FINANCE
AVAILABLE ON ALL SYSTEMS OVER £250*
Terms & Conditions apply.
Credit subject to status and affordability.

* Credit subject to status and affordability. Credit is provided by a panel of lenders with whom we have a commercial relationship - we are not able to provide independent advice. Terms & Conditions apply. Credit subject to status and affordability.

Intel, the Intel Logo, Intel Inside, Intel Core, and Core Inside are trademarks of Intel Corporation in the U.S. and/or other countries.
Terms and conditions are on the website. All Trademarks are acknowledged. Pictures are for illustration only. Prices are correct at time of going to press (04.11.2015). E&OE.

/chillblast @chillblast

Contents

What's in the magazine and where

News, reviews & features

10 The Gallery
A hand-picked collection of incredible artwork to inspire you

22 Achieve Pixar Quality at Home with RenderMan
Discover the key features of RenderMan and how you can use it at home to achieve genuine Pixar-quality renders

32 Natural Enemies: The Making of The Good Dinosaur
We go behind the scenes of Pixar's second film of the year and find out all about animating dinosaurs

66 Technique Focus: Path Tracer
The extremely talented Zeno Pelgrims gets technical with volume scattering

73 Technique Focus: Berserker
Mattias Lind tells us about his approach to character sculpting

80 Review: Houdini 15
Rainer Duda takes on Side Effects' second release of the year to find out what its new tools are all about

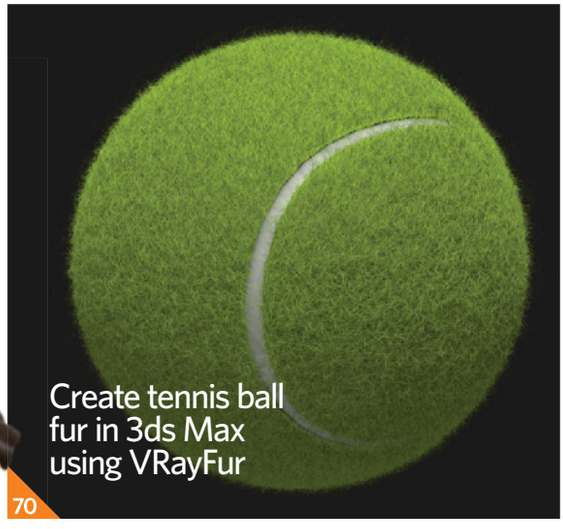
82 Review: MARI 3.0
Daniele Orsetti takes The Foundry's latest iteration of the leading texture painting tool for a spin

84 Subscribe Today!
Save money and never miss an issue by snapping up a subscription

"Pete said Spot was 75 to 85 per cent wolf or stray dog, but he has the ability to climb trees"

Mike Venturini explains his director's vision for The Good Dinosaur's Spot **Page 40**

32

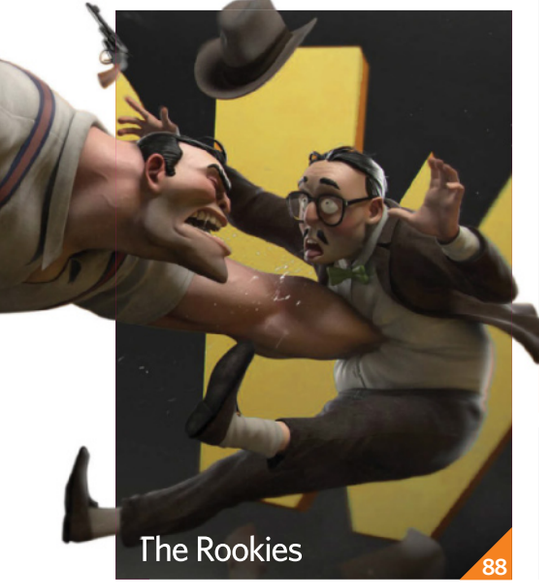


Create tennis ball fur in 3ds Max using VRayFur

70

Create a dust effect in KeyShot and Photoshop

68



The Rookies

88

SAVE 40%
SUBSCRIBE TODAY

Turn to page 84 for details

Create mood with volumetric lighting

76

Render a photorealistic supercar

42

"To a major extent, RenderMan created modern high-end CGI"

Chris Ford on why RenderMan is such a special tool **Page 24**

22

Master advanced lighting with Octane

50

DOWNLOAD FROM THE FileSilo

- Over five hours of RenderMan videos from Pluralsight Creative
- Pixar scene files
- Three CGAxis HDRIs
- 25 3DTotal textures
- Tutorial files and images

Turn to **page 96** for the complete list of this issue's **free downloads**

filesilo.co.uk/3dartist

Visit the **3D Artist** online shop at imagineshop.co.uk for back issues, books and merchandise

The Pipeline

42 Step by step: Render a photorealistic supercar
Reinier Reynhout shows you how to achieve the ultimate level of realism

50 Step by step: Master advanced lighting with Octane
Eric Keller returns to help you get to grips with lighting the natural world

58 Step by step: Render a realistic interior scene
Alexandre Jarek reveals how you can master interior arch-vis

68 Pipeline techniques: Create a dust effect in KeyShot and Photoshop
Learn from Pablo Castaño what it takes to create believable textures and effects in your renders

70 Pipeline techniques: Create tennis ball fur in 3ds Max using VRayFur
3ds Max master Vikrant Dalal is on hand to walk you through achieving a convincing fur effect

76 Pipeline techniques: Plane tracking and compositing in Blender
To add to the list of 'things you didn't think Blender could do', Sean Kennedy reveals some key compositing techniques

The Hub

86 Community news
The CG Student Awards becomes The Rookies

88 Industry news
Autodesk revamps its Flame family and Animatrik breaks a record

90 Project Focus
Tippett Studio
The studio takes on a theme park

94 Readers' gallery
Community art showcase

The Gallery

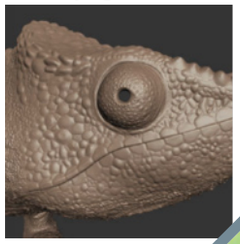
Have an image you feel passionate about? Get your artwork featured in these pages
Create your gallery today at **www.3dartistonline.com**

Jonathan Vårdstedt
jonathanvardstedt.com

3DArtistOnline username:
JonathanV

Software Maya, Mudbox, Photoshop, OctaneRender and Knald

Work in progress...



"I've never done any animal before with a lot of detail to it. Therefore, I wanted to make a chameleon, as they require a lot of detail both modelling and texturing-wise, which is always fun!"

Jonathan Vårdstedt, *Chameleon,* 2015

Andrei Mikhalenko
behance.net/andi_mix

3DArtistOnline username: Mikhalenko

Software Marvelous Designer, 3ds Max, Photoshop

Work in progress...

"I created this image, which was inspired by the TV show *Edwardian Farm*. In the scene I tried to create the warm atmosphere of an old house"

Andrei Mikhalenko,
The house is empty now, 2015

“After ZBrush introduced FiberMesh, I became obsessed with the possibilities. I built a process to create dreadlocks using Fibermesh. The Warrior seemed like a good way of testing this hair technique”

Pablo Muñoz Gómez, *Warrior,* 2013

Pablo Muñoz Gómez
pablander.com

Pablo is a concept artist, animator and instructor for 3D and traditional sculpting

Software ZBrush, Photoshop

Work in progress...

Ian Spriggs
ianspriggs.com

Ian is a character modeller who has around ten years of industry experience

Software Maya, Mudbox, Photoshop, V-Ray

Work in progress...

"I think portraiture shows the life and story of a person and relates it to the world. I tried to create a mood in this piece – I wanted to show you who he is through the use of lighting, composition and pose"

Ian Spriggs, *Portrait of Geoffrey Spriggs,* 2015

OVERCLOCKERS UK
www.overclockers.co.uk

RENDA

PROFESSIONAL WORKSTATIONS

5 YEAR WARRANTY • BUILT & STRESS TESTED • CONFIGURABLE • ENGINEERED BY THE EXPERTS

RENDA PW-E7F

FREQUENCY ENHANCED, LIQUID-COOLED WORKSTATION

The Renda PW Series provide a flexible, powerful liquid-cooled workstation solution - designed around the Intel X99 chipset.

With finely tuned hardware, and vast customisation options, you can tailor your Renda machine to suit your needs.

- Intel® Core™ i7 5820K @ 4.3GHz (Upgradable to 5930K @ 4.2GHz)
- Asus Z99-E WS EATX Motherboard
- Up to 3 x NVIDIA Quadro or AMD Firepro Series Graphics
- Up to 64GB DDR4 2133MHz Memory
- Configurable SSD & HDD storage
- Five year warranty as standard

Prices from
£2024.94 inc. VAT

explore renda

Renda M-H5F & M-H7F

Compact design with flexible customisation, without power limitations.

Renda M-H5F & M-H7F

Mid-tower build with optional frequency enhancement for increased performance.

Renda T-E7 & T-X3

Up to 16 core Xeon processing power with dual graphics card support options.

Renda P-E7, P-X3 & P-X6

Up to dual Xeon and triple graphics card support for huge performance when you need it.

Built for Pros with Intel Inside®

www.overclockers.co.uk/renda

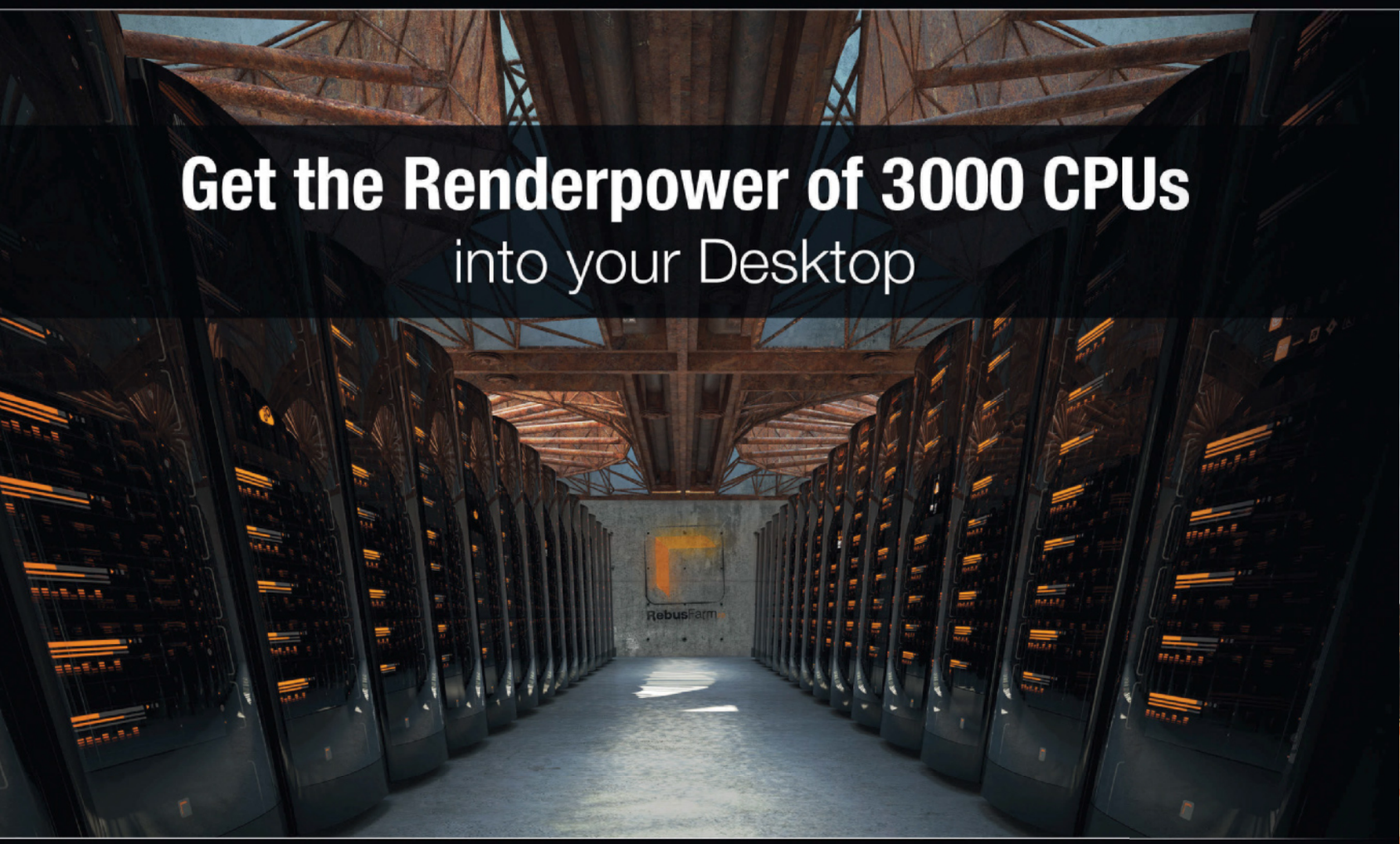
Overclockers UK | Unit 5 Lymedale Cross, Newcastle-under-Lyme, Staffordshire, ST5 9BT

Prices correct at time of print but may change without prior notice. All items subject to availability. Specification may vary.
Intel, the Intel Logo, Intel Inside, Intel Core, and Core Inside are trademarks of Intel Corporation in the U.S. and/or other countries.

intel inside™ CORE™ i7

RebusFarm
Render Service

Get the Renderpower of 3000 CPUs
into your Desktop



Making your deadline in time was never cheaper,
easier and faster than now!

- Best price
- No waiting time
- Advanced apps and plugins
- All major software packages supported
- 24/7 processing and support

35€
Free Trial
Only for new registrants.
Bonus Coupon Code:
3DA-RE-14X57VQ

www.RebusFarm.net

Rendered at RebusFarm Render Service

Víctor Enrich 's work is a constant manifest about one same subject: the City.
The city, not only understood as the very well-known process of adding, subtracting or modifying spaces for all sorts of human activities but also as a complex system of nodes that involve and connect everybody's blurry dreams, exacerbate passions, fearful nightmares or even tedious social life.
(**http://victorenrich.com**)

This image is part of a project consisting in rendering 88 different geometric possibilities of one single building, all expressed in one single shot. The 88 images are edited together to form a video, which is the actual art piece, that you can find here **https://vimeo.com/81182837**

"I was inspired by autumn and wanted to create a landscape with a lot of grass and autumn colors with a muted, cloudy mood since, its not really a setting that you work with that often"

Simon Barle, *Scottish Highlands,* 2015

Simon Barle
www.simonbarle.com

3DArtistOnline username: Fozwroth

Simon is a 3D artist living in Stockholm. He's been in the games industry for 4 years

Software Unreal Engine 4, Photoshop, Substance Designer, ZBrush, Maya

Work in progress...

> I've always been interested in foliage for games – I like the challenge of creating natural diversity. I'm very active with personal projects, striving to improve myself
>
> **Artist Name,** *Scottish Highlands,* 2015

VEGETATION SHADERS
I setup my vegetation shader with as much control as possible – this enabled me to quickly tweak base color and subsurface color on the fly. I could efficiently create copies that had a different look.

TEST COMPOSITION
TOP Early blockout testing composition using only a landscape and a temporary grass mesh, I took my time trying to set an overall mood without going into too much detail. A reference model was used to check my scale.

ASSET MODELLING
LEFT To get better shading and clean masks to work with, I high-poly modelled every vegetation asset and baked them down to textures, which I applied to simple plane geometry. This way the normal map benefits from crisper detail and bolder angles.

FOLIAGE VARIATION
Using Unreal Engine's foliage tool, I could quickly paint out the undergrowth and achieve a variation in types by painting with several assets at the same time.

SimLab Composer 6
Designers' affordable Luxury.
A smart 3D application that will transform your design into an art piece.
With a powerful and fast Real-Time rendering engine.
Simlab Composer 6 editions cover all your needs, choose from : Hobbyist/Educational , Pro, Mechanical And Ultimate Edition.
starting from $4 per month.
"We believe the secret to our success is pretty simple, We think partners, not clients".
Try it now
www.simlab-soft.com
SimLab Soft
Bringing art closer

00//>_<1100//00<1001/1]
264>3(84276[2[64[}5({39
{72>>29[6{2_56((32[()95
62(6{9)7]>7(}<]]9>4]3{7
0 MORE- <
/ 1
> 0
264>3(84276[2[64[}5({39
{72><INNOVATION>32[()95
62(6{9)<CUTTING_EDGE>72
64>3<DISCOVERY>[}5({395
72>>29[6{2_56((32[()953

BATH SPA UNIVERSITY

Achieve more with our MSc in Creative Technologies and Enterprise

Not all postgraduate degrees are created equal. Study for yours at Bath Spa University and give yourself a head start in the creative industries.

Our course will help you hone your creative skills, making sure you're prepared for the rapidly-changing global digital economy.

Get more from your future, visit bathspa.ac.uk/cte

DIFFERENT THINKING

ACHIEVE PIXAR QUALITY AT HOME

RENDERMAN

3DArtist spoke exclusively with the RenderMan development team about the renderer's latest iteration and what the future holds

19 PAGE Disney PIXAR SPECIAL

What could be more encouraging for the development of your creative work than using high-performance rendering software developed by a major animation studio? The new version of RenderMan is being used by Pixar on its current productions, which include *Finding Dory*, *Coco*, *The Incredibles 2*, *Toy Story 4* and *Cars 3*.

Above all else, it seems fair to say that RenderMan seeks to maximise creativity and its heritage in this regard has produced a flexible platform that can adapt to a variety of pipelines, and be tuned to the unique artistic goals of each project. Among other new features in the current – and forthcoming – iterations are pattern shaders and increasingly nuanced global illumination capacities. RenderMan is the result of high-end research into how best to constantly evolve the technology in service of artistry. Key to RenderMan's success has been its support for a diverse user community that has contributed to the immense popularity of the software. This community has allowed Pixar to broaden its view when adding features, which ultimately benefit all users. Direct engagement has always been important to the RenderMan team, whether through addressing a critical fix, or assisting an artist who is just embarking on their journey.

> "It's a matter of understanding the unique capabilities that RenderMan brings to solving the ever-evolving challenges presented by 3D graphics"
>
> **Chris Ford,** business director at Pixar

All The Good Dinosaur, Inside Out, Pixar studio and RenderMan press images © Disney Pixar

The advanced capabilities of RenderMan have made it popular among studios and home users alike

> RenderMan created modern high-end CGI visual effects and animation, and we continue to innovate new technologies and workflows
>
> **Chris Ford**

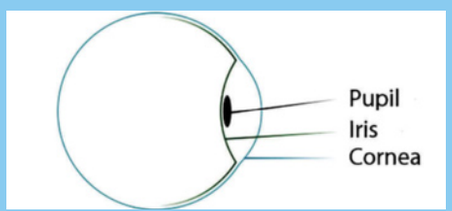
With RenderMan, digital artists have the opportunity to work with software that's globally recognised for its robust and flexible performance in a production environment where, at Pixar, it's used every day in a variety of departments and on a variety of projects. In fact, RenderMan's reach is right across the entire production industry. An important hallmark of RenderMan is its 'productibility', a term that references RenderMan's capacity to generate not only visually arresting individual frames, but its capacity to also handle a large volume of work, produced on time and on budget from massive scene inputs.

A multi-threaded resource, RenderMan has proven its compatibility with machines with multiple cores and has demonstrated the degree to which it allows for increased production efficiency. For example, its physically based shading facility can be delivered with minimal setup. Of RenderMan's features, Chris Ford says, "To a major extent, RenderMan created modern high-end CGI visual effects and animation, and we continue to innovate new technologies and workflows. The new RIS architecture is a modern, global illumination path tracer that offers a built-in collection of high-quality pattern shaders and BXDF materials, and provides complex light transport via uni-directional or bi-directional path tracing. In addition, RenderMan benefits significantly from access to the world's largest R&D effort in film-production rendering. Recent examples include new production shaders, like Marschner hair straight from Pixar's production team, and Disney's new Denoise functionality that speeds up the creation of final ray-traced imagery by ten times in some situations. These are just a sample of features that are currently unduplicated in other renderers."

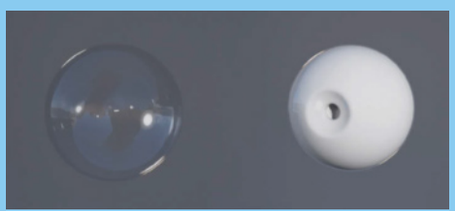
Key to the evolution of RenderMan is the next-gen Denoiser, and Ford offers a useful overview, noting that, "Disney's denoising technology has radically improved the speed at which physically based ray-traced imagery can be delivered, and its use in production so far has

RIS EYE STUDY

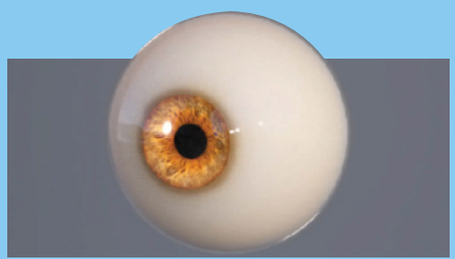
Master the art of believable eyeballs with Murad Abujaish



01 Eye Anatomy To get the eye right, you need to understand its anatomy. This will allow you to model a physically accurate eye so the shading behaves realistically. Use two objects with two shaders – first, the pupil and iris, while the second is the bulging, transparent cornea.



02 Build the cornea The cornea of the eye is a transparent surface. To achieve a greater level of photorealism, use a PxrLMGlass. You'll get a more realistic refraction from the lens of the cornea, which can be stylised and customised until it works for you.



03 Create the rest The iris is concave and has a fibrous textured surface, making light reflect in a unique way. Create this using rough anisotropic shading and Texture maps. For shading, use PxrLMSubsurface for the sclera and add a PxrLMLayer for the iris. The pupil must always be black.

Updates to non-commercial RenderMan are set to mirror updates to the commercial version

RENDERMAN 21 AND BEYOND

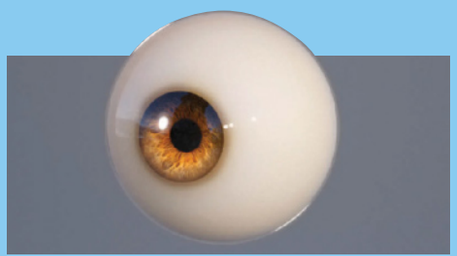
We asked the Pixar team about what lies ahead when the toolbox is opened on RenderMan 21

Will non-commercial RenderMan continue to be updated in tandem with the paid-version ?
Because non-commercial RenderMan is essentially the same build, it will always be immediately accessible online whenever a new release is announced. Expect NCR 21 to be available the very same day that commercial RenderMan 21 is made available.

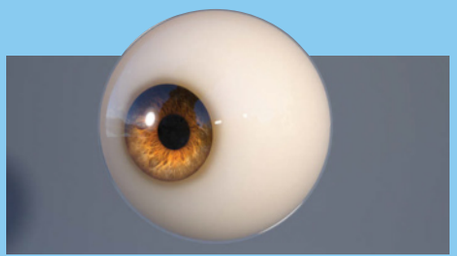
What has the response to the RenderMan 21 beta been like so far?
There has been a lot of interest in the upcoming RenderMan 21 beta that is scheduled to begin shortly. The advantage of being a commercial user is exclusive access to the beta. A pre-registration site for early sign-ups has been established.

What are the key new features included in RenderMan 21 ?
RenderMan celebrates its 21st anniversary with over 60 new features including major rendering mode enhancements, temporal volumes, GPU-based denoising, native OSL support, metered licensing, and out-of-the box usability advances. The next-gen Denoiser coming in RenderMan 21 includes GPU support and other optimisations, including improved handling of hair that is currently being implemented in Disney's upcoming feature, *Zootopia*. More will be announced soon. All commercial RenderMan users are entitled to automatic beta access and will be notified of this by email. All purchases of commercial RenderMan 20 from now until the release of 21 (in early 2016), will receive an automatic upgrade to the new release.

04 Advanced iris shading A realistic iris has two main features. First, the edges will always be darker – this can be achieved by multiplying the Color map with a black-and-white circular ramp. Next, the upper iris is always darker than the lower iris, so multiply a ramp to the Color map.



05 Creative shading Now is the part where you can get a little bit more creative with the eye shader. You can add Bump to the cornea or iris patterns to the Specular. You could also paint finer details in the subsurface response in order to simulate veins.



06 Additional detail Renderman RIS is very easy to use to create accurate shading. Understanding a little bit of anatomy can go a long way for modeling and shading your eye. Using multiple shaders and geometry can help you to get better physicality in your renders.

pointed to additional improvements. Denoise is a good example of the technology synergy between Disney research and RenderMan."

Dylan Sisson of the RenderMan team, offers a sense of Pixar's research, noting that it feeds into the studio's production process. To illustrate, Sisson focuses on improvements made to the Marschner Hair model: "Leonid Pekelis, Christophe Hery, Ryusuke Villemin, and Junyi Ling published a technical report at **http://graphics.pixar.com** titled *A Data-Driven Light Scattering Model For Hair*, where they describe improvements that have been folded into the Marschner Hair model available in RIS today. They implemented a novel version of adaptive importance sampling for Marschner hair and added additional azimuthal roughness control and model natural fibre torsion. This implementation is also fully energy preserving."

THE IMPORTANCE OF RIS GLOBAL ILLUMINATION TO THE DEVELOPMENT OF RENDERMAN

Sisson explains that "RIS was written from the ground up as an easy-to-use framework for customising different methods of light transport in your renders. It allows users to generate high-quality, photorealistic imagery quickly and efficiently by selecting those methods that best suit their needs. Additionally, RIS allows new lighting and rendering methods to be easily added as our research and development proceeds. Many do not realise that RenderMan is the newest and most advanced renderer currently accessible to the public, and that the flexibility and performance of RIS represents a game-changing rendering paradigm for both VFX and feature film animation." He goes on to state that, "Pixar's 2016 film *Finding Dory* is being completely rendered using RIS. In fact, due to the complexity of its many underwater shots, this movie has been a primary driver in the development of the technology, and you can expect RIS to raise the bar in visual realism as much as *Finding Nemo* did, when it was first released. Going forwards, all Pixar films will be rendered using RIS."

> "Due to the complexity of its many underwater shots, Finding Dory has been a primary driver in development"
>
> **Dylan Sisson**

SETTING THE SCENE: RENDERMAN'S OPEN SOURCE USD RELEASE

One of RenderMan's open source releases is USD, and Sisson explains that "During SIGGRAPH 2015 we announced that our proprietary Universal Scene Description (USD) format is to be released as open source. USD is currently used to describe, assemble, modify, and exchange high-complexity virtual scenes between various digital content creation tools. The forthcoming public USD distribution includes embeddable direct 3D-visualisation provided by Pixar's modern GPU renderer, Hydra, as well as plug-ins for several key solutions including Maya, Houdini, MARI, KATANA, NUKE and RenderMan, comprehensive documentation, tutorials, and complete python bindings. The current plan is to release USD during SIGGRAPH 2016. A key aspect of a USD-based pipeline is an ability for multiple artists to operate simultaneously on the same collection of assets in different contexts, using separate 'layers' of data that are composited together at various stages. USD generalises these concepts to make them available across different applications. We have already shared early snapshots of USD with a number of industry vendors and studios for evaluation, feedback, and advance incorporation, including facilities that are using Alembic, given that USD can easily reference and apply edits to existing Alembic scenes."

REACHING RENDERMAN

In our cross-platform, multi-channel age in which we access diverse content and toolkits, RenderMan has now been brought to ZYNC, and Ford explains how. "Simply, we wanted to make RenderMan available through different channels to match different customer needs. Our partnership with Google to bring RenderMan to ZYNC will be a wonderful fit for a lot of artists. We know that cloud rendering with RenderMan has already been useful to

ZBRUSH TO RENDERMAN

Develop a vinyl toy prototype with Dylan Sisson

01 Goal In this tutorial you'll learn to create a photorealistic prototype for a vinyl toy using ZBrush, Maya, and RenderMan, primarily focusing on lighting, shading, and vector displacements. This is a fast and efficient method for finalising a sculpt, choosing paint styles and colorways, and then visually communicating these details to the manufacturer with a realistic visual mockup.

02 Sculpt This vinyl toy, Idle Hands, was inspired by a napkin drawing, which I used as reference to sculpt and paint the model in ZBrush. After the sculpt is complete, prepare the model for RenderMan by creating good UV coordinates for the model. Using ZBrush's UV Master, it's easy to unwrap the model to ensure that everything will map properly and that the seams won't be visible from the front of the model.

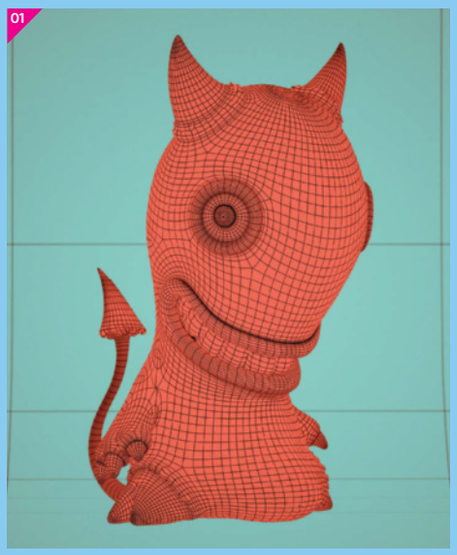
03 Export Bring the model into Maya from ZBrush. The Multi Map Exporter tool makes it simple to export everything required for this prototype: an OBJ model, an Ambient Occlusion map, a Cavity map, a Color map, and a 32-bit Vector Displacement map. It's important to use the correct settings when exporting a Vector Displacement for RenderMan. Be sure to export a 32-bit openexr and enable smooth UVs, normals, and tangent coordinates. ZBrush will create all these assets.

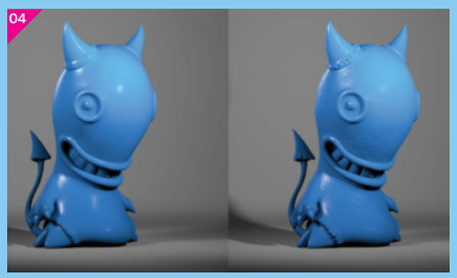
04 Displacement Open Maya, import the OBJ and verify that the Vector Displacement is working properly. As Vector Displacements are able to capture folds and subtle nuances that a normal Displacement cannot, all of the detail from the original sculpt in ZBrush can be captured using only a lightweight OBJ, making the scene easier to work with and faster to render. To set up the Displacement, attach a Disney Principled material to the model and add a specialised RenderMan Displacement. After connecting the 32-bit Vector Displacement map and setting the mode to ZBrush Vector(Tan), it works perfectly.

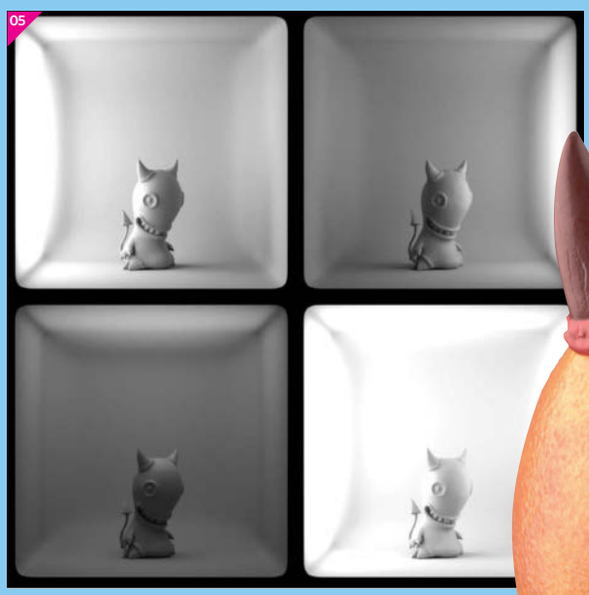
05 Light To speed up the lighting process, I created a library of light rigs, and for this toy prototype the 'light tent' rig is perfect. With the light tent imported into the scene, fire up an interactive rendering session in RenderMan and open the RenderMan Light Panel, which is a master control panel for all the lights in the scene, allowing lights to be conveniently adjusted and even put in Solo mode, to isolate any light's exact contribution.

06 Shade the toy Now it's time for the fun part – creating the final look for the toy. Using RenderMan's physically based shading, many details can be sorted out beyond simply choosing colours. Qualities such as shine, wear, and bump can all be dialed in with photorealistic accuracy, and interactive rendering makes this process quick. For this prototype, I created an LM Plastic material, adding several layers on top of the base and using the maps exported from ZBrush to mask them.

07 Render the toy The combination of ZBrush and RenderMan is both powerful and straightforward. With RenderMan's excellent support of 32-bit Vector Displacements, anything modelled in ZBrush can be rendered using RenderMan. After exporting the assets from ZBrush, creating the prototype was quick, taking under two hours, and the end result is fittingly photorealistic.







Vinyl toy model and tutorial © Dylan Sisson

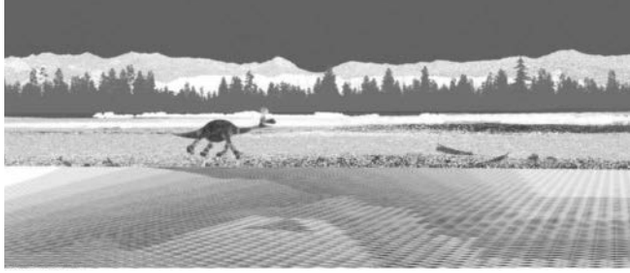
studios, including Pixar, who have set up custom cloud solutions. The ability to scale off-site compute resources up and down as needed provides a more flexible solution for everyone. RenderMan on ZYNC can provide similar cloud capabilities to a different group of users, such as smaller studios, or even people using non-commercial RenderMan at home, who need to render out a big project. Our trial RenderMan On Demand cloud rendering service, which ran from 2012 to 2014, helped us learn about the features that people need in this area, and helped shape our multi-pronged cloud strategy of which ZYNC is a key component.

RENDERING FOR ALL

RenderMan's non-commercial access has proven somewhat overwhelming to Pixar, and Ford states that, "Frankly, the response has been overwhelming. We never quite anticipated that the size of the RenderMan community would increase by one to two orders of magnitude, but it has. Our intent was to make RenderMan accessible to anyone and we believe that we have achieved that goal. Democratising RenderMan access was a key objective, and if you have not downloaded a copy, try it."

As such, home-use of RenderMan has expanded greatly and Sisson notes that, "When free, non-commercial RenderMan was released, a commercial modelling and animation package to feed it was still required, and for many home users that added expense was not an option. So we developed a completely free way to use RenderMan, with the recent release of the plug-in, RenderMan for Blender, which is open source. This is a great option for anyone who wants to use non-commercial RenderMan on their own personal projects. There has been a great response so far from the Blender community. The Showcase area on our community website shows what many individual and home users are now producing."

When we talk with Ford about how many of our readers are students and enthusiasts hoping to work in the industry, he offers some thoughts regarding ways to improve renders using RenderMan. "RenderMan offers some of the most advanced rendering technology available, so it's a great place to learn shading and lighting for visual effects and animation and learn how rendering simply works. There are so many ways of using RenderMan, from independent animation to scientific visualisation, so it comes down to where you wish to focus. There is an active RenderMan community for new users to ask questions when starting out, and it's a matter of understanding the unique capabilities that RenderMan brings to solving the ever-evolving challenges presented by 3D graphics."



MAKING THE GRADE

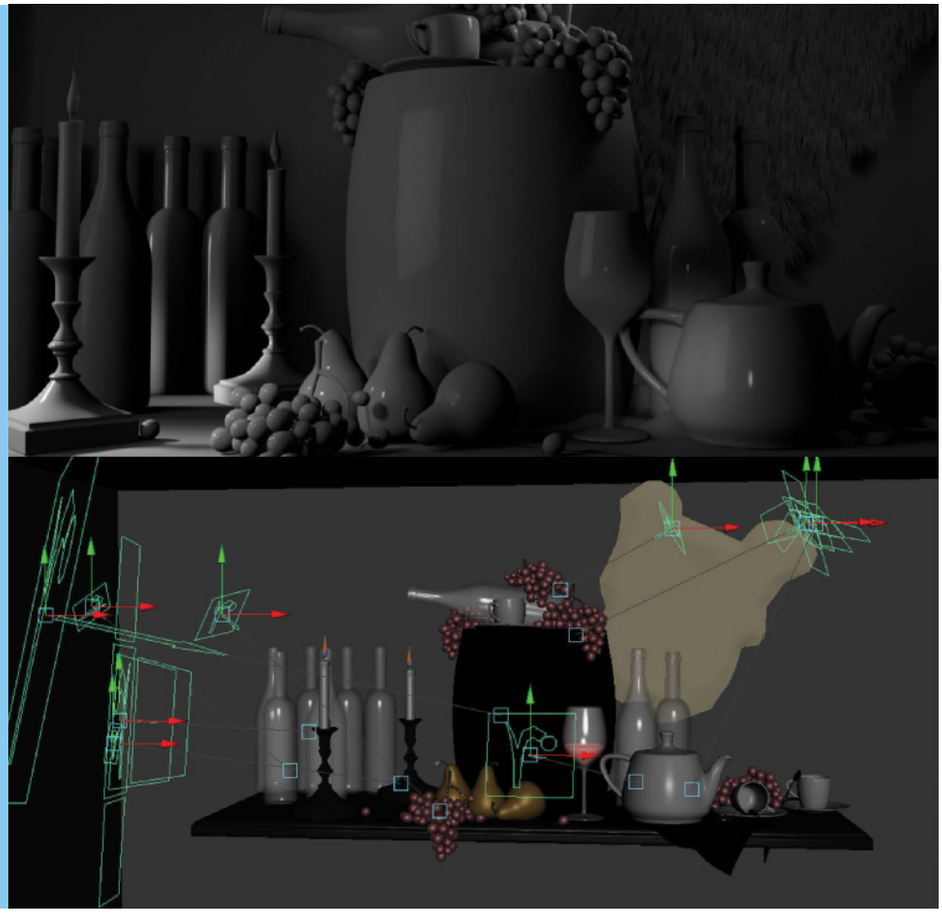
Dylan Sisson identifies three resources that you can access and work with right now in RenderMan to achieve Pixar-like quality in your work

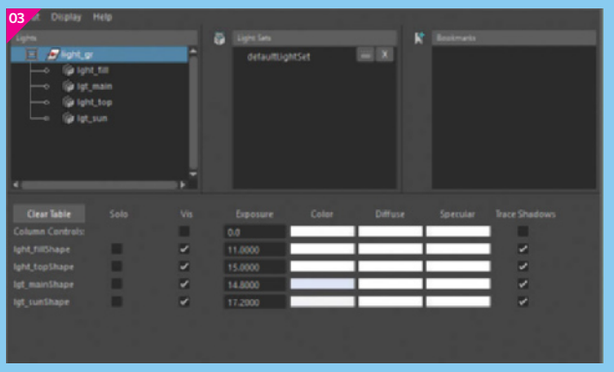
"RenderMan offers a big toolbox for creating high-quality feature-film animation and photorealistic visual effects. It's really the job of RenderMan to be 'pixel agnostic' and not force any sort of visual style on anyone; that's the director or artist's job. There are many tools that are immediately accessible out of the box, and have been battle-tested in productions in studios throughout the industry. Many years ago, it was true that using RenderMan required programming custom shaders, but today that is no longer true. With our RIS technology, RenderMan can be used out of box". Here are just three things to check out:

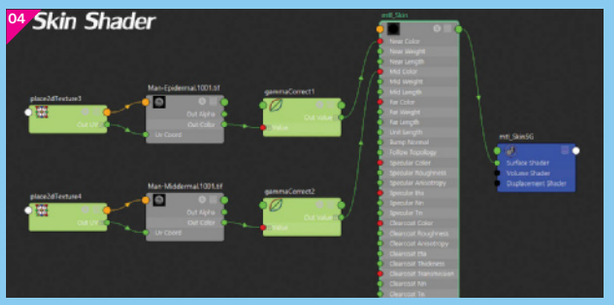
1 The IPR interactive rendering system is very fluid in RIS, making shading and lighting fast and productive, and most importantly, fun.

2 RenderMan has always been renowned for Displacements. You can obtain the highest-quality possible using 32-bit maps and Vector Displacements. For those sculpting with 3D paint programs, RenderMan plays nicely, and can render even the most complex sculpts in photorealistic detail.

3 Image Based Lighting is straightforward, and RenderMan can handle hard cases of 32-bit HDRIs with super-bright areas. You can get sharp shadows from a single environment light source using an HDRI. Sisson explains, "There are great resources available at **www.renderman.how** with examples from other users, light rigs and material presets and video tutorials explaining many aspects of making production quality renders with RenderMan."







LIGHT AND RENDER A CHARACTER WITH RENDERMAN

Achieve a Pixar-style scene in five easy steps with Jude Leong

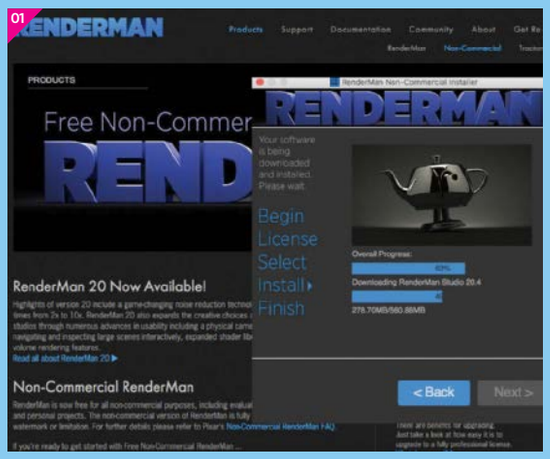
01 **Get started** It is important to have an idea or a concept in mind before starting your project. These could be your own or other artists' concept art, photography, or other CG artwork. There are many valuable resources to draw inspiration from. Websites such as Pinterest, Flickr, and Tumblr are excellent places to go to kickstart the creative process.

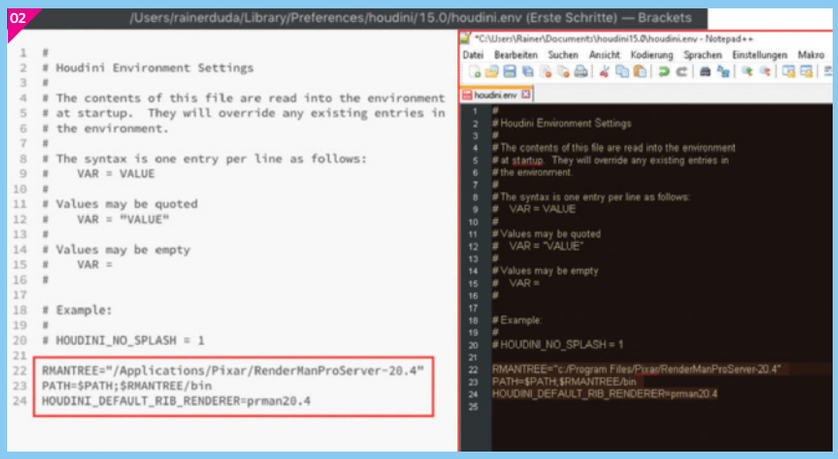
02 **Set up the camera** Once you are done modelling the assets, it is time to start composing the scene. Determine what the focal point of the scene will be. In our case, the main focal point will be directed towards the character. Once our camera is positioned, we can add Depth of Field to the scene to direct the viewer's attention towards the character. This can be done by going to the camera attributes, and changing the settings under Depth of Field. Set Focus Distance to the distance between the camera and the Focal Point. Lowering the F-Stop strengthens the effect of the DOF.

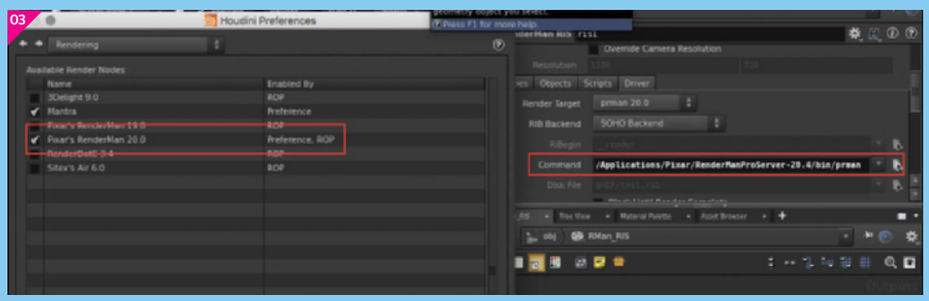
03 **Light the scene** This scene uses a three-point lighting setup, but instead of a Backlight, use a top light to simulate the ceiling lights. All the lights in the scene are standard RenderMan Area Lights. I've also added an area light outside the walls of the office space and added proxy blinds geometry to achieve the effect of sunlight pouring. The light outside the walls is scaled much smaller than the other lights to achieve sharper shadows.

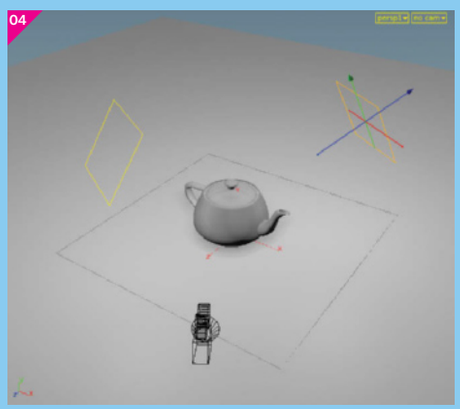
04 **Shade the scene** The majority of the scene is shaded using PxrDisney materials without different textures painted in MARI. The PxrDisney shader is very versatile and has an awesome slide to control the metallic appearance of an object. The character is shaded with PxrLMSubsurface material using two separate textures for Near Color and Mid Color. The Near Color texture is typically a more unsaturated version of the Mid Color Texture. Play around with the Near and Mid Weights while in IPR mode to fine-tune the character's appearance. You may also have to Gamma Correct your texture depending on the wokflow you use.

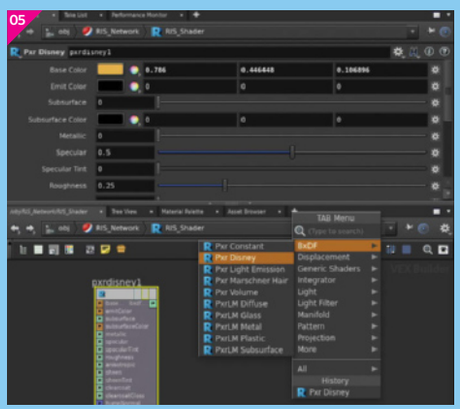
05 **Composite the render** Once you are done with the render, take your image into your favourite compositing program and add any final touches that you want.

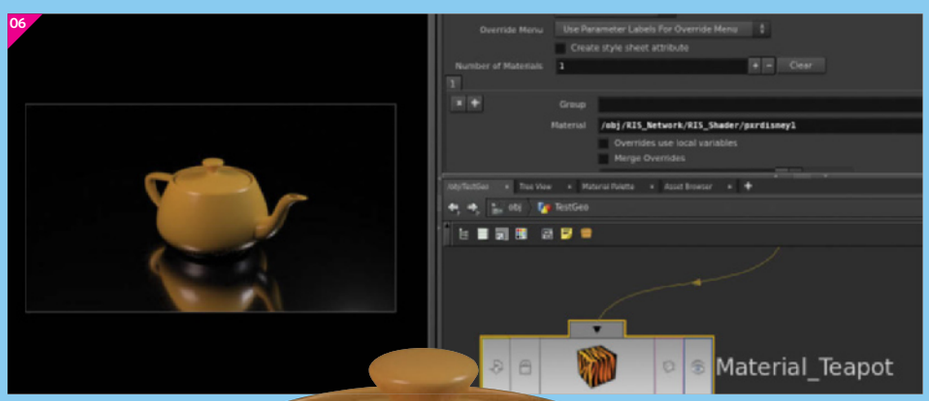



02
/Users/rainerduda/Library/Preferences/houdini/15.0/houdini.env (Erste Schritte) — Brackets
# Houdini Environment Settings
# The contents of this file are read into the environment
# at startup. They will override any existing entries in
# the environment.
# The syntax is one entry per line as follows:
# VAR = VALUE
# Values may be quoted
# VAR = "VALUE"
# Values may be empty
# VAR =
# Example:
# HOUDINI_NO_SPLASH = 1
RMANTREE="/Applications/Pixar/RenderManProServer-20.4"
PATH=$PATH;$RMANTREE/bin
HOUDINI_DEFAULT_RIB_RENDERER=prman20.4
houdini.env
RMANTREE="c:/Program Files/Pixar/RenderManProServer-20.4"









GET HOUDINI 15 READY FOR RENDERMAN

RenderMan's RIS shading capabilites and interactive rendering is fully supported in Houdini 15, so discover the groundwork you need to get started with the help of Rainer Duda

01 **Download RenderMan** Go to the Pixar homepage (http://renderman.pixar.com) and create an account. After your registration, you can download the latest version of Pixar's RenderMan pro server including a non-commercial licence on your machine.

02 **Add environment variables** You now need to change the houdini.env file by adding new environment variables, which point to the RenderMan install folder. Make sure you type in the specific paths that you defined before the installation so that Houdini finds all necessary paths.

03 **Enable RenderMan** After the environment variables are in place, check the last values. Let's jump into the Rendering Preferences under Edit. Set the flag to enable Pixar RenderMan. Make sure the correct command line for prman is set in the Driver tab in a new RenderMan RIS output node.

04 **Light the scene** When your geometry is set, prepare the scene with correct light setups. Open the Tool menu within the Network Editor pane and jump to the Render menu. Over there choose Pixar lights like the Pxr Sdt Area light and bring it in place inside the perspective view.

05 **Create a shader** Next, create a new SHOP network in the Network Editor pane. Dive inside the SHOP network and create a new RIS shader network through the Tool menu. Now dive inside this RIS shader network and in there, create a BxDF shader – preferably the Pxr Disney one.

06 **Assign the shader** Last but not least, assign the RIS shader to your object by jumping into the Geometry node. Create a new Material node, and in the Attribute Editor for the Line Material assign your RIS Pxr Disney material. Render your scene in the Render View by assigning the Renderman RIS Output node and your camera.

The RenderCube® Family

Accelerate Your 3D Renderings And Projects

The RenderCubes are preconfigured for most renderers such as Autodesk® 3ds Max®, Autodesk® Maya®, Mental Ray®, V-Ray®, Cinema 4D® Team Render, Blender™, Octane®, Arnold® and many more.

Vist the Renderfarm Guide to learn more: **www.rendercube.eu**

CADnetwork®

Premium. Performance. Innovation.

All company and product names are trademarks or registered trademarks of the respective owners.

“In most dinosaur movies, there is a bad guy. We tried to make nature that character”
Peter Sohn, director

All images © Disney Pixar

NATURAL ENEMIES

THE MAKING OF THE GOOD DINOSAUR

Barbara Robertson discovers how Pixar sent animated characters into a vast, painterly world

A boy and his dog – it's a familiar story. At least it was, until director Peter Sohn and his team at Pixar Animation Studios gave it a most unusual twist. The 'boy' in *The Good Dinosaur*, Disney/Pixar's 16th animated feature, is a dinosaur named Arlo and the 'dog', a young boy named Spot.

The conceit is that dinosaurs never actually became extinct. Herbivores like Arlo's family of Apatosauruses became farmers, while carnivores like the T-Rex became ranchers. In the film, these dinosaurs live in the American West, an area littered in real life with numerous dinosaur dig sites.

Based on the jagged peaks of the Teton Mountains in Wyoming, Arlo and his family live at the foot of the Clawed-Tooth Mountains in an idyllic red farmhouse in a green meadow. While set in a beautiful location, its isolation suggests vulnerability, and it's this tension between beauty and danger that permeates the film. Young Arlo is particularly vulnerable.

"In this frontier world, Arlo is incapable," Sohn says. "He always sticks to his father." And then one day a horrendous incident tumbles Arlo into a wild, swift-moving river. When he emerges, he's far from home. "He's alone and terrified," Sohn continues. "The world is so huge, it dwarfs this 18-foot-tall dinosaur. It's threatening and beautiful all at the same time. In most dinosaur movies, there is a bad guy. We tried to make nature that character."

Sohn became convinced that nature would be an antagonist – the "biggest monster of all," as he puts it – during a research trip with production designer Harley Jessup and director of photography Sharon Calahan.

"For every Pixar film, we try to go to the place that's the equivalent of where the story takes place," explains Jessup. "For this film, we went to northern Wyoming, Jackson Valley and southern Montana. Then we created the biggest sets I've ever worked on."

Jackson Valley – more commonly known as Jackson Hole Valley – lies between the Teton mountain range and the Snake River in western Wyoming on the Idaho border. If you were to draw a line north from Snake River Canyon, past the Teton Mountains and on to Yellowstone National Park, you could see, roughly, the mountainous area in which the film takes place.

"Peter wanted us to see vast distances at all times," sets supervisor David Munier explains. "It was a different way of working for us."

MILES OF TERRAIN

Munier estimates that 40 artists on his team would eventually adapt 167,000 square kilometres of North America to follow Arlo's journey, while another ten artists filled the skies with clouds. "We don't see every square kilometre, but we have all that data to explore with a camera," he says. They started with an iconic photograph of the Tetons and the Snake River by Ansel Adams.

"Rather than do production design from scratch and try to mimic that look, we downloaded United States Geological Survey data for that area and tried to find the same spot," Munier explains.

The tireless crew scoured the three-dimensional terrain map until they found a match. Then they searched for a suitable location to plant Arlo's family's farmstead.

"We treated it like a live-action scout," Munier continues. "We had a layout artist take a virtual camera through the map and take snapshots of the terrain. We would take different views of one piece of terrain from one vantage point so Pete could see a bird's eye view or one down in the set. He bought off on it as a great way to start."

Next, the artists produced a test render from the USGS Terrain map with added details and small-scale Displacement for trees and grass to show how quickly they could produce that low-level detail. Sohn, Jessup, and Calahan loved the result, which proved to be a good starting point.

Eventually, the crew would send Arlo – and little 'dog' Spot he encountered along the way – through hundreds of kilometres of USGS data, modified and embellished until they achieved the "painterly realism" that Calahan envisioned.

"Sharon [Calahan] took a major role in creating the look," Jessup states. "Her familiarity with Wyoming and her experience as a landscape painter folded deeply into what we would do."

Calahan was raised in a rural area of the Northwest and more recently had spent her holidays painting in Jackson Valley.

"This film was a true labour of love for me," she enthuses. "When I watched the story reels, my head would be flooded with images. I tried to do a painting right away. Pete [Sohn] wanted a familiar and timeless world, a world that would draw the viewer in. He asked me to paint iconic landmarks and a variety of terrain."

PAINTERLY REALISM

As the artists' designers stylised the terrain, the Tetons became modified into the film's Claw-Toothed Mountains, but with the base pushed back from the farmhouse and with an even steeper grade. The mountains' shapes and the fact that they would be the only mountains topped with snow, would help the audience recognise Claw-Toothed through the film. "We wanted it to be iconic from different vantage points," Munier says.

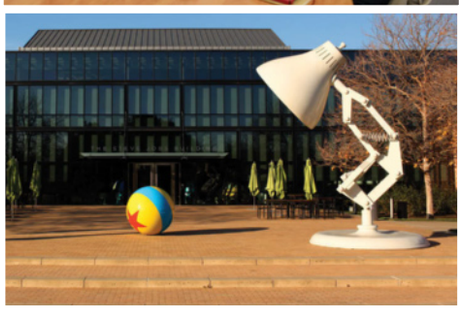
As for the rest of the landscape, Sohn wanted the design to lean toward reality and away from the film's caricatured characters. "Pete wanted the world visually rich and believable," Calahan says. "The dangers would have visceral impact. But it isn't photorealism. If you look closely at any rock or object, it doesn't look real. [It's] the sum total [that] gives the impression of realism."

Calahan created a style guide with such rules as reduction (the silhouette is important, not individual leaves), massing detail in backgrounds to recognise a forest of trees but not so much that you read individual trees, and massing together values and colours, clumping vegetation into pleasing groups, using one dominant colour. The goal was to create what the eye sees, not the camera.

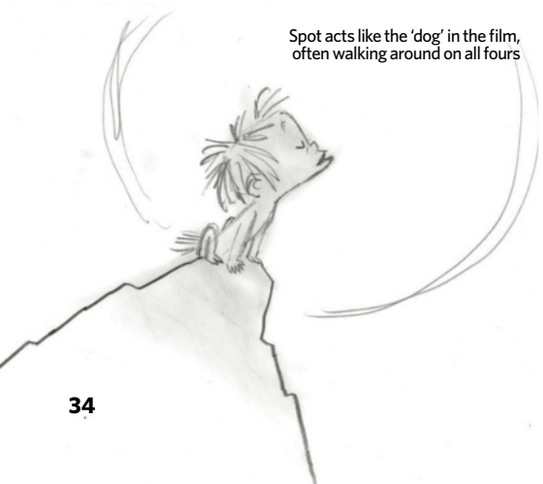
"Usually the sets teams create foregrounds and one-off establishing shots," Munier explains. "Then matte painters create texture cards for the distance. But for this film, Pete didn't want special shots. We did traditionally built and set-dressed foregrounds, and in the backgrounds we put hundreds of thousands of trees in the terrain and added procedural rocks, stones, and bushes."

To avoid having to physically model all of that detail, the teams read in height data from the Terrain maps at render time and added the finer details procedurally. Rather than build random

The T-rex family are a bunch of ranchers with their own farmland

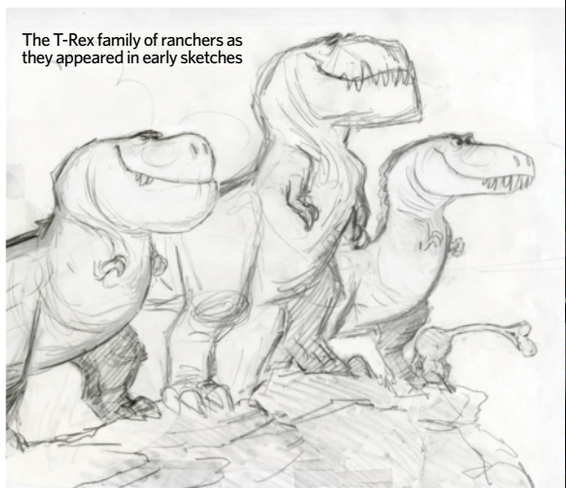


> "Pete [Sohn] wanted a familiar and timeless world, a world that would draw the viewer in"
>
> **Sharon Calahan,** director of photography

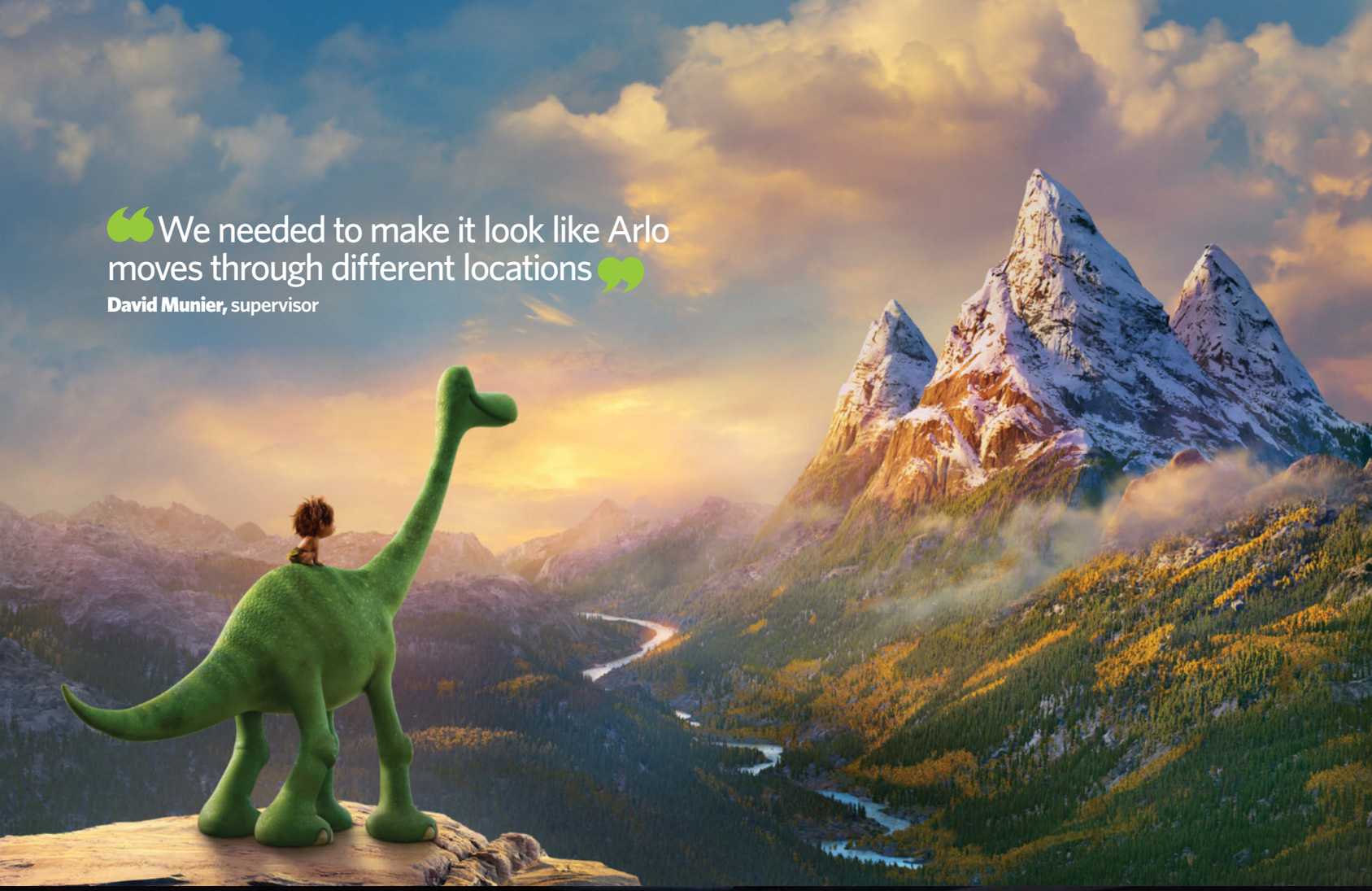


Spot acts like the 'dog' in the film, often walking around on all fours

Early sketches of Arlo and Spot sharing a tender moment



The T-Rex family of ranchers as they appeared in early sketches



“We needed to make it look like Arlo moves through different locations”

David Munier, supervisor

“John Lasseter kept saying, ‘Make sure the dinosaurs are big. That’s part of the fun of it’”

Mike Venturini, supervising animator

The real-life Teton Range is the setting of Clawed-Tooth Mountains

trees, the art and production teams designed trees and vegetation appropriate to the locations that the film was set in – pines, cottonwoods, and aspen trees, as well as Indian grasses, particular types of bushes, and so on.

"We'd use the USGS data as the foundation," Munier says. "That gave us the topology. We'd extract that data into a physical model in Maya and sculpt on top. Then we'd bake that back into our transformed USGS data for RenderMan to read in. That gave us the basis for placing our trees, rocks, and bushes. We'd paint where we wanted to put them. On top of that, we could drive Texture maps. Arlo is constantly travelling. We needed to make it look like he moves through different locations."

AN EMOTIONAL LANDSCAPE

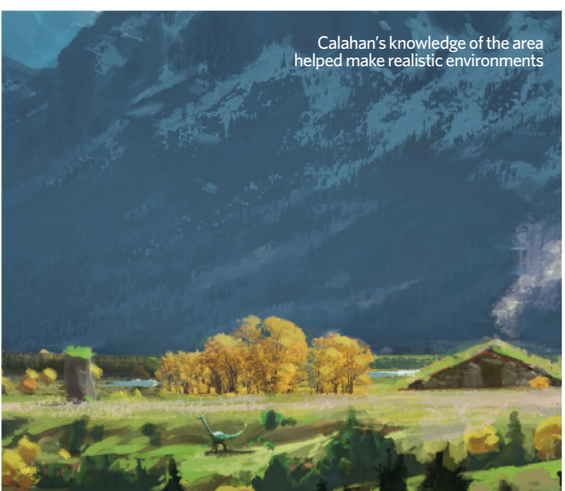
Travel, he does. Arlo climbs a sheer cliff and walks through tall prairie grass. Elsewhere, he meets the T-Rex ranching family on a high-desert plain. He shares a sensitive moment with Spot on a beach near the river.

"There were times when Arlo needed to look vulnerable, so we'd show a big landscape," Jessup explains. "And Calahan did a colour script for the film that was brilliant." It's this colour script that gives the landscape even more feeling, whether dominated by river, mountain or meadow.

"This is a very emotional film," Calahan says. "And the job of the colour script is to support that emotion. The process evolves with the story. I'd start with the highs and lows and the tent pole scenes, and then plot out what was in between."

Once the designers and set dressers created the varying landscape for one tile of Terrain map after another, they carved the river into the landscape – the very river that took Arlo from home and would eventually lead him back.

"The river is the visual spine of the movie," Jessup states. The river moves in parallel with Arlo's emotion, often reflecting the degree of Arlo and Spot's attachment. To create the water, the effects team ran multiple simulations within Houdini to produce modules of turbulent, calm, fast-moving, and other types of water, each module a quarter to a half-mile long. Then they worked with



Calahan's knowledge of the area helped make realistic environments

USGS terrain data proved to be invaluable to the Pixar team

Another familiar setting is that of Snake River in Wyoming

the set dressers to piece these modules together and create the film's 194 river shots.

The rain, created by the effects team within Houdini by instancing along curves, also heightened Arlo and Spot's emotional states. The rain falls softly in some scenes, and blusters dangerously in others. So, too, do the clouds.

"The clouds act almost like a monster at times," Calahan describes. "Other times, they're light and fluffy." Typically at Pixar, artists paint the clouds and lighting artists match the painting. For this film, Calahan wanted volumetric clouds. "I wanted procedural clouds in every shot to cast shadows and respond to light the way everything else does," she says.

The artists tested the possibility by attempting to reproduce one of Calahan's paintings. They found the area in the USGS terrain that matched, placed a camera to match, added vegetation and ground cover, and then the volumetric clouds. "Randy Berrett, one of our matte painters, pushed ten or so small volumetric clouds objects around in Houdini to set dress the clouds. It worked perfectly," Munier concludes.

ANIMATING ARLO

Moving through this carefully constructed landscape – which seems so real, but never photorealistic – are several stylised, caricatured characters. Arlo the dinosaur and Spot the little boy are the chief characters, but the supporting cast includes the T-Rex ranchers and their 'cattle', which the crew dubbed 'Bisonodons', and a Stegosaurus that collects magical creatures.

The difficulty in designing Spot was in finding ways to articulate his little human body so that he could sit like a dog and run on all fours. For Arlo and his family it was in remembering how big they are.

"I had to keep reminding the crew that Poppa's head is taller than the Pixar building," Jessup laughs. "He's 40-feet tall. John Lasseter kept saying, 'Make sure the dinosaurs are big. That's part of the fun'."

As for the pet collector, "I think he was Pete's idea," Jessup says. "The first time I saw him was in a story pitch. He was so unexpected, but he plays an important part of the story. We gave [character designer] Matt Nolte carte blanche to make up his own critters, one nutty character after another. He based them on animals that would be in the area, but a lot have prehistoric vestigial parts."

To perform these characters, animators worked with the latest version of Presto, Pixar's in-house animation system. "Presto is constantly evolving," says supervising animator Mike Venturini. "We didn't develop anything specific for this film, but we used many new tools developed over the last films."

One tool in particular really helped animators perform the Apatosaurus's long necks. "We needed specific rigs with length guides and direct manipulation tools," Venturini states. "If the animators saw red spots in the neck, they knew they were off model."

It was this new ability to see textures in early Presto recording that really helped the animators. "We can attach animation to Displacement, not just to vertices on the model," he continues. "But the most notable change to Presto over the last films is our ability to act with recordings – to draw directly on our animation using [Wacom's] Cintiq tablet."

This became particularly important for the dinosaurs. "As part of our research process, we tried to understand them as physical beings; to imagine ourselves in their bodies," Venturini continues. "This is complicated by the fact that you can't look, touch, feel, or see how they move. So, we

Presto chango How Pixar used footage of elephants to animate the dinosaurs

Pixar didn't develop new capabilities within Presto, the studio's animation system, specifically for this film. However, the system's constant evolution did give animators new tools. The ability to draw over recorded footage was particularly important for understanding how a massive animal moves efficiently. To refine the dinosaurs' performance, the animators recorded elephants at a zoo, analysed that movement, and developed four key building blocks.

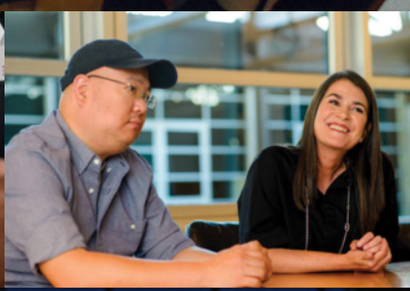
The four poses were

1. Full, front leg stride. Chest down, head up, hips up.
2. Head down, chest up, hips down so the other leg can come through.
3. Mirroring the first pose with the full front-leg stride, but on the other side.
4. A front angle that shows the weight distribution.

"If you animate an elephant walking with a sway, unless the feet are in the right place, it feels fake," says Venturini. "The more we understand that, the more we can caricature the performance."

> The artists and the technical people at Pixar can do anything

Denise Ream, producer



In front of the Steve Jobs Building at Pixar Animation Studios, California

used elephants as a starting point. Arlo is 10 to 12-feet tall at the height of his back and that's in the ballpark of an adult elephant."

Animator Kevin O'Hara brought his vast experience of animating horses for the traditionally animated film *Spirit*, dogs for Pixar's *Up*, and rats for *Ratatouille* to the project. "As animators, one of the most intimidating things to do is to animate a quadruped because there are so many moving parts," he says. "Especially with something so heavy. Slamming feet isn't efficient. Locomotion is all about efficiency; the elements have almost graceful movement."

To find that graceful efficiency, animators would draw over at a recording of an elephant on one side of the computer screen. They had their animation tools on the other side.

> "Peter wanted us to see vast distances at all times"
>
> **David Munier,** sets supervisor

"We have the movie recording play in Presto," Venturi says. "It's the same playback window that we use for our animation playback. Kevin can draw over the movie. That's new and fresh for us."

O'Hara points to footage of the elephant walking toward camera. "Here, when he has weight over his front-right foot, see how he rotates his chest," O'Hara says. "His weight is taken up in the mass of shoulders and chest. That gives him a graceful walk, but you still feel the weight. When his weight is planted over a foot, he sways the most. It's the same in the rear, and this is where we get a lot of personality. When he has his weight over a foot, he rotates his hip to take that weight. We boiled down their movement to key poses and used those as building blocks [See Presto chango, p38] Then we could add acting."

The building-block poses created by watching the elephant footage helped the 84 animators on the project give the dinosaurs weight, and it helped them stay consistent even when the gait changed for different types or ages of dinosaurs.

"Herbivores have different foot falls than carnivores do," O'Hara goes on to explain. "Herbivores are more restricted. We pushed elements in timing to up the energy and make a dinosaur feel young. Or, slow the timing down for older dinosaurs. However, the biggest thing was knowing where the weight should go."

For Spot's performance, the animators referenced dogs, squirrels, raccoons and other animals. "Pete said Spot was 75 to 85 per cent wolf or stray dog, but he has the ability to climb trees," says Venturini. "He is comfortable in his environment, but hesitant in approaching humans," which in this film are the dinosaurs.

As Arlo and Spot journey together, they learn to face their fears. Spot learns to trust Arlo, while Arlo learns to survive in the wild. The Pixar team discovered that they could create a vast landscape with power and beauty through which the animated characters could journey. In this film, nature – as Sohn wanted – is the divine enemy.

"The artists and the technical people at Pixar can do anything," says producer Denise Ream. "We wanted to give them a story worthy of their talent."

The Good Dinosaur is out from 25 November

RENDERING THE AMERICAN WEST

Director Peter Sohn wanted to set Arlo and Spot's journey in the vast open and mountainous landscape of the American West. For Susan Fong, global technical and rendering supervisor, that created a huge rendering challenge. We spoke to Fong about how the studio managed to render these vast vistas

Did you use RIS for rendering?
RIS wasn't quite ready and our characters were already in development with final shading. We would have had to rewrite our shaders. However, we wanted a pure ray-tracing approach, so we used RIS techniques like instancing vegetation.

How did you optimise ray-tracing of the mountains?
We use light to shape the trees, but Shadow maps are muddy, so we traced the keys to give us a better look. But that's very expensive. Rather than baking Self-Occlusion for single objects, we used 'neighbour vis', a unique spherical harmonics technique that calculates what the neighbour occlusion would be.

Peter Sohn (far right) and some of *The Good Dinosaur* crew getting stuck into planning

WS-X ENHANCED WORKSTATION

BUILT FROM THE GROUND UP FOR OPTIMISED PERFORMANCE AND ROCK SOLID RELIABILITY

INTEL INSIDE ® EXTRAORDINARY PERFORMANCE OUTSIDE.

CONTACT A REPRESENTATIVE

WWW.WORKSTATIONSPECIALISTS.COM

+44 (0) 800 180 4801

SALES@WKSMAIL.COM

Workstation Specialists

© 2015 Workstation Specialists – Acecad Software Ltd. E & OE. © 2015 Intel Corporation. Intel and Intel Core are trademarks of the Intel Corporation in the U.S. and/or other countries. Logo & company/ product names are trademarks of their respective owners

Render a photorealistic supercar

Learn to make a realistic car and environment for multiple realistic renders

The aim of this tutorial is to learn how to make a 3D scene for a supercar so that you can make a lot of different renders and different angles with it. Our approach is that this is a car that we think should go fast but should still look beautiful.

When you are finished, you should be able to produce very quick, multiple images based upon the rendered scene. In this tutorial, we will not be doing a lot of work in post-production and try to do as much in 3D as possible – otherwise you have to do that post-production work for every image or animation that you want to make.

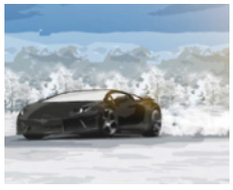
We tend to spend a lot of time on making shaders and we like to avoid having to do any unwraps where possible. We also love photography so we will refer to that a lot, because most 3D artists would benefit from learning core photography skills.

REINIER REYNHOUT
The Aventador, 2015

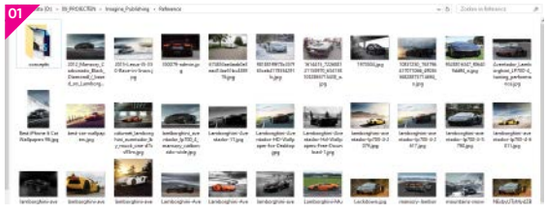
Software
3ds Max, V-Ray, Forest Pack, Photoshop, After Effects

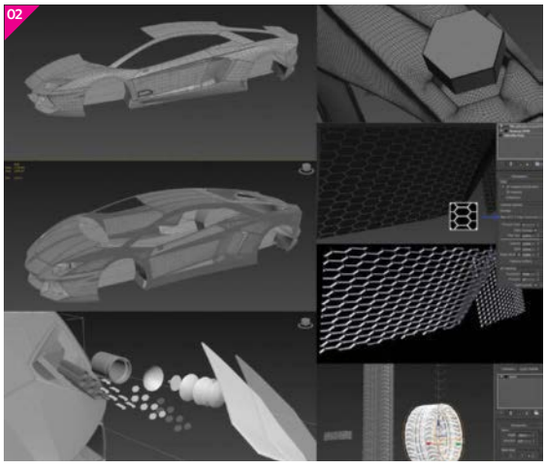
Learn how to
- Make a nice car model
- Do realistic shading and realistic lighting
- Build the environment
- Composite

Concept
The concept was pretty simple, I wanted to make the Aventador and I wanted to do something with snow.



YOUR FREE DOWNLOADS from **filesilo.co.uk/3dartist**
- Tutorial screenshots

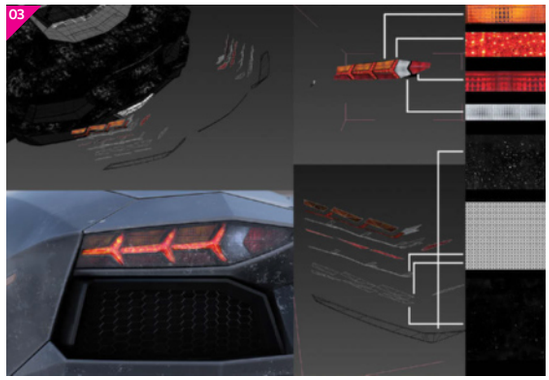




01 Reference The first thing that needs to be done is collecting as much information about the car as possible. We collected 55 hi-res pictures to look at. What is important are the details like parking sensors, grids, logos and badges, and the lights. Most of the car models out there are pretty nice but lack in detail in the headlights and rear lights. With enough photos we can start building the car!

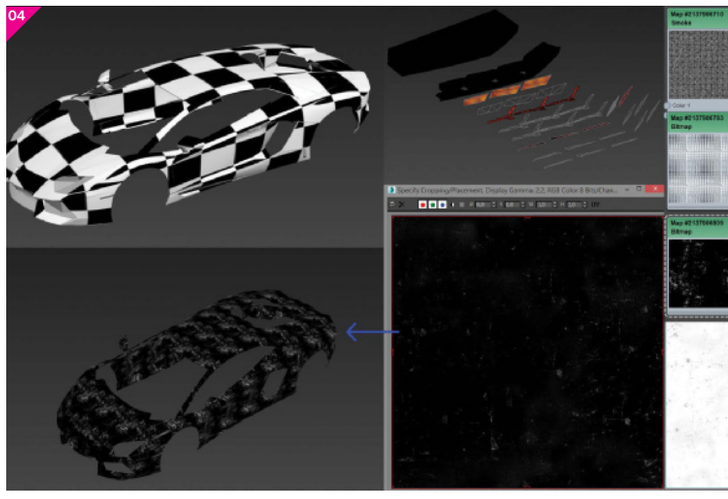
02 Poly count When building the base mesh, start with the symmetry modifier on top of the stack. When building the car, it helps to see it mostly complete. The modelling is just building and there are no real cheats or new tips to produce better models. The most important thing is to have enough polygons near the edges as they will catch better highlights and cast nice little shadows between the different parts of the car exterior. So don't be afraid of heaving a lot of polygons, they help improve the image. The tyres are always a struggle, so make them flat. Create one patch, instance it a couple of times and bend it with the modifier. The other way to do this is to copy it by angle.

05 The environment The work on the environment is the easy part here: it's a plane with lots of segments. There are two shaders: the snow and the rocks on the mountains. The texture that blends the two is also used for the displace on the plane to create the mountains. The tyre track is a separate texture made in Photoshop, used for displacing the ground plane. The mountains in the back are proxies in the end, otherwise the scene would become too heavy. In total there are three kind of trees in the scene, all scattered around randomly. We moved the trees and bushes around to benfit the composition. The bushes are in fact the trees pushed under the ground plane, but it seems to work pretty well. The mountains and the ground plane do have an extra VRayDisplacementMod to randomise the ground. The scene is made in such a way that you can put the camera wherever you want.



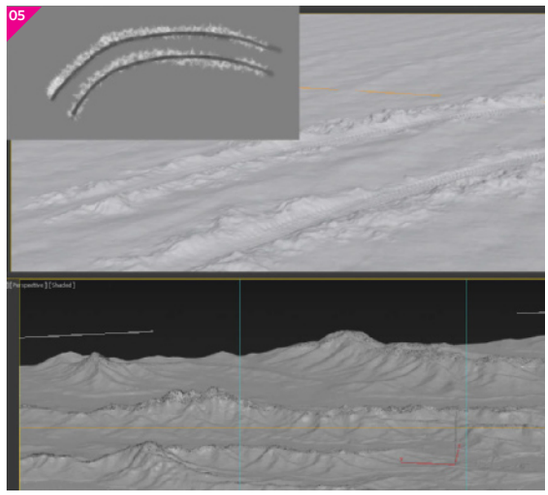
03 Model the lights The headlights, rear lights and the lights on the side of the car are pretty complex. For this you just need to add a lot of duplicate glass plates between the chrome-shaded plastic shell and the glass cover. As illustrated in the last step, you can see there are six layers of glass between the outside of the car and the first light will serve as the headlight. This is important for getting lots of details in the lamps; in the rear light the same thing happens. A total of eight layers make the lamps. Every glass layer has a unique shader with different textures in it. In a way this is overcomplicated, but the results seem more realistic. For the lights we made a couple of tileable textures and added them to a V-Ray light material; when the lights are turned off it's just a standard V-Ray material. No Bump or Reflection maps are used for the coloured parts because there will be plenty of those as layers on top of that.

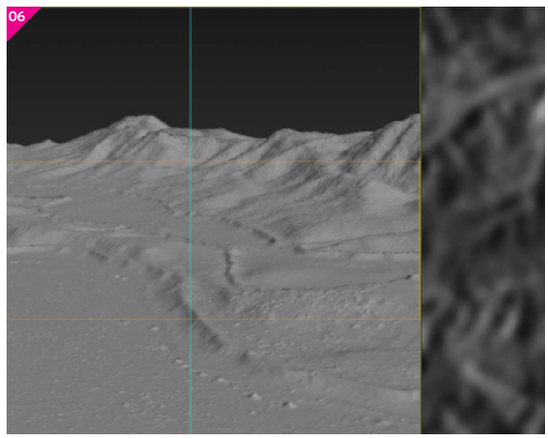
04 UV Maps Unwrapping is sometimes difficult so we are always looking for ways to skip this or find the easiest cheat to achieve the goal. This car has only planar, box and cylindrical unwraps. Every part gets one, even the objects that only need simple shaders like glass, steel or chrome. The reason is that in post-production you sometimes need an extra pass for dirt and scratches, and in that case you still need the UV maps. So when you have your base model done, just give it a quick UV map. The checker is just to match the scale on all objects. For the final render a snow pass was made to increase some dirt and snow on some parts of the image. We've done this in 3D so the perspective, depth of field and angles are always correct. For complex shapes we use pelt mapping, but that is almost never the case.

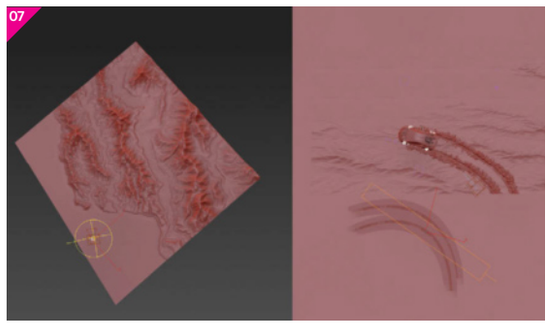


06 Paint the hills For this portion of the project you'll need to start with creating a ground plane that is 10,000 cm square with 1,000 segments in length and width. It is pretty dense, so if your machine doesn't like it you can create a patch that is 25 per cent of this. On top of the plane that you've created you'll need to add the UVW planar map and after that the VRayDisplacementMod (enable existing mapping). Open up Photoshop and start brushing hills and mountains. A good point of reference for this stage is to use terrain altitude maps. Often we create brushes for this based on these maps. Another way would be to use World Machine – if you want to create environments you could always use this. However, World Machine was not used here.

07 Duplicate the displacement modifiers If the terrain that you've built looks too flat or smooth, add another VRayDisplacementMod on top of it and move it to get a different displacement modifier over your displaced plane. When there is an area that looks good to you, just slice the rest of it away with the Slice Modifier. Never delete it if you can help it, because from other angles you can use the rest of the mountains for variation. Create a V-Ray proxy of this background and repeat the same process for the ground surface. In this project the same texture for displacement used for the mountains is the same for the ground surface. Only tyre tracks were added and the scale of the map is different. The mountain erosion works really well to encourage the suggestion of wind blowing across the snowy surface, which will help to create atmosphere in your scene.







08 The basic materials When building a car it's sort of always the same thing. Make rubber materials, car paint, glass, hard plastic, headlights, rear lights and some chrome as well. This means that when you've made them once, you can repeat using them. At least that's what we would want – in reality we build new materials every time. The approach is always the same of course. But we believe that every time you think of it again, you'll learn new things. In this project the car paint is the most important shader. When looking at a shader it is important for you to understand and break down the material, so grab a camera, go to a car and take pictures of it for the metallic car paint and get this as close to the colour as possible. You can see the flakes in the render and under the flakes is the base coat. On top of the flakes is the clear coat. That's it for the paint, but in this case we decided to add some extra layers within the shader because there is also dirt, weathering and snow in our scene/object.

Showcase

Reinier Reynhout

Like a lot of people out there I grew up with *Star Wars*, *He-Man* and all these effects-driven movies. They stuck in my mind and my path was clear: I would become a VFX or CG artist. I got my master's degree in 2006 and went on to work in this industry, and I love it!

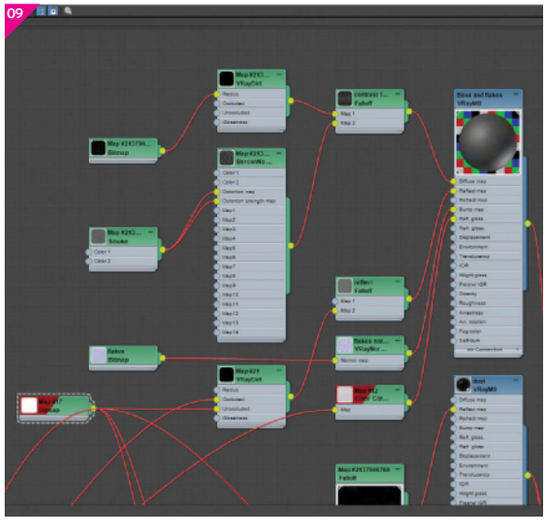
Ode to Fury Road **3ds Max, V-Ray, Photoshop (2015)**
Just after seeing *Mad Max* I wanted to create a car that could be out there.

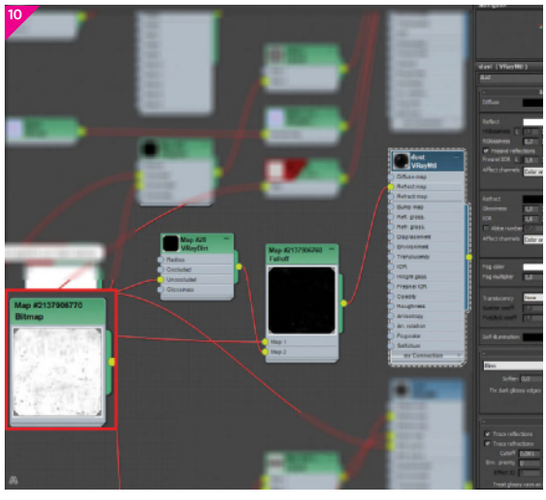
Living room **3ds Max, V-Ray, Photoshop (2014)**
Architectural visualisation of a Dutch farm.

Close Up **3ds Max, V-Ray, Photoshop (2014)**
Close-up render of some props used in an apartment.

09 Build the shader

We will start off the shader-building process by creating a V-Ray material for the base coat and flakes. The material should not be too reflective because that's what the clear coat's purpose is. Create a falloff material for the base coat. In the two slots add some textures with the average colour you like. We have used a smoke node with two dark grey tones for this in order to achieve randomness in the base colours. Try to avoid using a standard colour or value. If it is texture based, everything gets a unique parameter and that will increase the realism. Then the same process is done for the reflection map. We will also make use of a falloff map with a texture in it, only this one will be brighter. Often an V-Ray dirt map is added in between to get more or less contrast near the edges. In the reflection slot it will reflect less near the edges because that's where the dirt or weathering is. For the flakes, a Normal map is used to bump the surface.





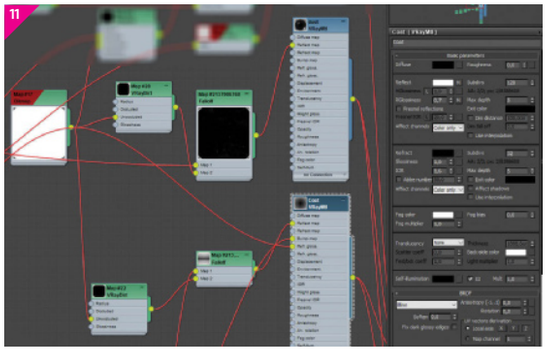
> We will start off the shader building process by creating a V-Ray material for the base coat and flakes

10 Dust shader

The dust shader is an extra layer that adds some dust, snow and damage on top of the base shader. It is in fact a black shader with a black texture with some white splotches or speckles, with water droplets in it. The V-Ray dirt has the texture in the unoccluded slot so it will add some extra reflection on top of the base layer for snow, dirt or water leaks or condensation effects.

11 Clear coat layer

The clear coat is the highly reflective coated layer. For the reflective map the same input is used as the dust layer we just created. This is because the clear coat should be on top and the less reflective parts from the dust layer should be on top of the clear coat. This way we achieve the same result. The same dust texture is used to drive the glossiness for some random dirt stains on the clear coat.



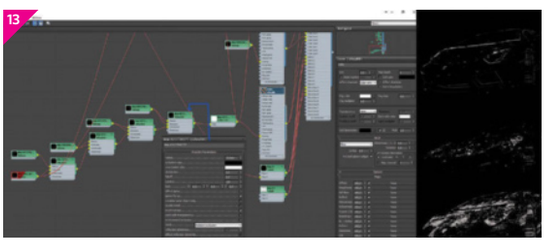
Photography and limitations

Since the camera makes the final image, it is highly important to understand photography. The best advice I ever got was to buy a DSLR and make a hobby out of it. When you understand photography you understand lighting, composition and camera settings. These things are very important in 3D for making a nice image. It saves a lot of time and you get better results immediately. Also, try to stick to real-life values of camera lenses in 3D. When you create the lighting for the scene you can behave like a photographer. Create compositions, move around, play with shadows or highlights (use V-Ray RT).

12 Use the snow shader The snow shader is a duplicate from the dust shader and added on top of the clear coat. Again a black-and-white texture is the only input for this shader, except that the same black-and-white texture is now connected to the opacity slot instead of the reflection slot.

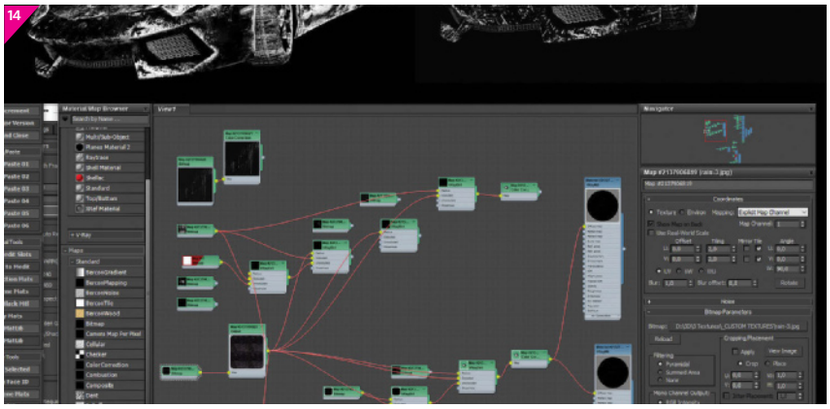
12

13 Leaks, snow, dirt, used universe This is the final shader that we will blend in the material. The leaks, dirt and snow shader is a duplicate of the snow shader, only it has a pretty complex network of nodes that are all duplicates of each other. They are connected in the opacity slot and are driven by VRayDirt nodes. This is the layer that makes the car look used and old. This shader can be used for everything: furniture, walls, guns... basically everything that needs to look used, damaged or affected by the weather. So the most important node is the VRayDirt node. The settings are pretty simple. Switch on Invert Normal and set the radius to the desired range (15 cm for the car is enough to keep it subtle). In the image you can see the effect of different textures in the radius slot.

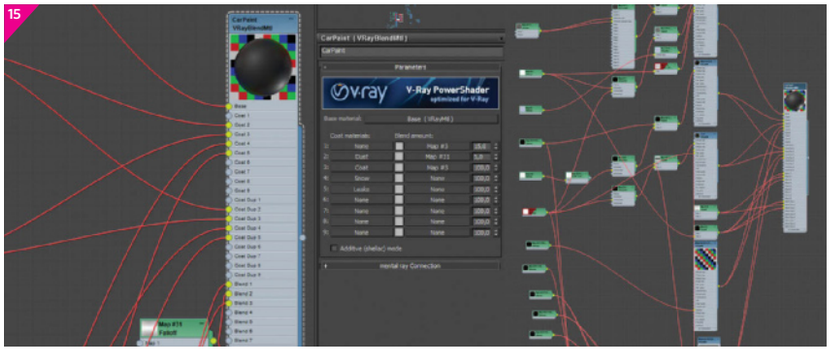

13

14 Tweak shaders Also in those images the radius is set to 50cm to show the possibilities of the amount of snow or leaks you want to have on your car. For each image this shader is adjusted to add or decrease the amount of snow and dirt on the car. The duplicate node is used to increase the contrast. The textures are just black-and-white images with random streaks or splatters. If you want only water leaks on the car you can add a black-and-white leak image to achieve that effect. The possibilities are endless with this layer in the blend material. Each shader should feel like it is used or has been affected by its environment. Try to give your scenes the feeling that it's part of a used universe. Nothing is clean and perfect in the world, remember.

15 Combine them all The final step is to combine these shaders in a blend material. They need to be added in the same order as we made them. The blend amount from the coat is driven by the falloff node, which is set to Fresnel to achieve the desired coated effect. The blend amount can be adjusted as needed to enhance the effect of the layer. This is similar to the radius in the leak layer per image, and this will be decided to increase or decrease the blend amount. Of course, you can leave this if you like the outcome, but personally we love the variation in every new render you make. Since there are enough slots here you can duplicate the leaks shader with different settings to cover the whole car with snow if you feel like the scene needs it. Just play around with this and experiment as much as you can.


14

16 The rear light shaders The shaders used for the rear lights are really basic. Because there is a lot of geometry in the rear lights the effect will be almost freeing. There are multiple layers of glass that will reflect, bounce lights and give the feeling of a complex rear light. The shaders are V-Ray materials with the texture in the diffuse slot or in the self-illumination slot in case the lights should be turned on. These are photos of Toyota lights altered in Photoshop to be tileable. The same leaks layer is applied on the final glass cover in the glass material, and this will be to blend everything together. That is why everything needs UV maps, including all of the glass or chrome parts.

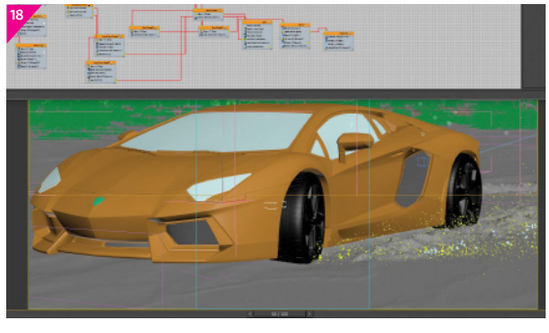


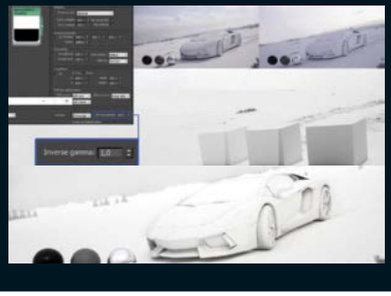
15

17 Photoshop layers For all these images, the layers we used were: reflection, refraction, V-Ray extra texture pass with V-Ray dirt in it, wire colour and multimatte. The reflection and the V-Ray extra texture (AO) are the most used to increase the contrast in the final image. The reflection pass is set to Screen Blend mode and the AO on multiply. The final image always gets an extra sharpening effect on it. This is mostly done with the high pass just before exporting. The multimatte and the wire colour are only used for quick selections of the environment or car parts. The refraction is used to brighten up the interior of the car.

17

18 Extra snow particles There are a couple of renders that suggest the car driving around. In fact the car is animated and a couple of particle emitters are used to create the snow around and under the tyres. These could be done in Photoshop, but again it's nice to have them in the scene so you don't need to think of them again when everything is done. The particle system is complex in this case, but it could be just a spray instead of this whole network. The point is that everything can be done in 3D. The motion blur will be accurate on the wheels and snow. The shader for these particles is a V-Ray material with a Noise map in the opacity to create gaps in the spheres so they look like flakes instead of spheres. For this step it is important to decide if you want to spend your time in learning particles or be quick in Photoshop and achieve the same kind of effect. If you are new to 3D, do this in post-production – don't waste time on this and spend time modelling or taking photos outside (unless particles is your thing!).


18



Light and render setup

Before beginning the shading process, it's important to nail the light setup for the final image. In this case the lighting and render setup are combined because the colour mapping has a great influence on the final contrast of the image. In the scene is one VRayDomeLight with a V-Ray HDRI in it. The HDRI that we used is from Peter Guthrie (number 1313). Nothing has been done in this case to enhance the HDRI light effect. The lower the value, the stronger the contrast and we can look at this vice versa too: the higher the value, the softer the shadows will be. Since the final set of images needs to be pretty cloudy, the preferred value would be 1 or 1.1. The colour mapping is set to Reinhard 0.25 for the bright multiplier and for the dark, its default will be set to 1. The result is a very cloudy day.

Elevate Your Workflow with Dedicated Rendering

renderPRO

Render or simulate at your desk or on the go because the versatile renderPRO is configurable with up to two Intel® Xeon® processors (28 cores) and requires only power and a network connection.

renderBOXX

The ultimate cornerstone of your render farm, renderBOXX features dual Intel® Xeon® processors (up to 36 physical cores). Ten modules fit neatly into a 4U (7"x19") space and IPMI 2.0 technology with KVM over IP provides the finest in network management.

RenderFarm on Wheels

Available in a wide range of sizes and expandable to over 80 modules (2880 cores), ROW is the ultimate turn-key render farm featuring rack-mounted, dual CPU render nodes housed in a mobile enclosure.

BREAKING NEWS

Introducing the World's **Smallest**

Overclocked & Liquid-Cooled Workstation

APEXX 1

For more information on BOXX rendering solutions, visit:
www.boxx-tech.co.uk OR call 01256 378000

BOXX Centerprise INTERNATIONAL

"Intel, the Intel logo and Iris are trademarks of Intel Corporation in the U.S. and/or other countries."

"Using NUKE, these render passes were composited together against a backdrop to create a stunningly realistic image"

Master advanced lighting with Octane

Discover how to composite this photorealistic study of a Mexican honey wasp in flight

This tutorial demonstrates an approach for lighting a photoreal 3D model of an insect in flight. After modelling the insect, the model and textures were imported into Maya, and the lighting and rendering were also set up in OctaneRender for Maya. Octane was used to generate lighting render passes which were then composited in NUKE. We want to show you how easy it is to create realistic lighting using Octane, as well as how to export render passes for specific lights. Using NUKE these render passes were composited together against a backdrop to create a stunningly realistic image. The little-known Mexican honey wasp was chosen as a subject because of its distinctive look – the abdomen has a pointed teardrop shape that gives it a rather elegant silhouette. It's also one of the few insects besides honey bees that makes honey. Inspiration came from Alex Wild (**alexanderwild.com**). This tutorial focuses primarily on lighting and compositing, and the model was created in ZBrush but you can use these techniques for other software.

ERIC KELLER
Honey wasp in flight, 2015

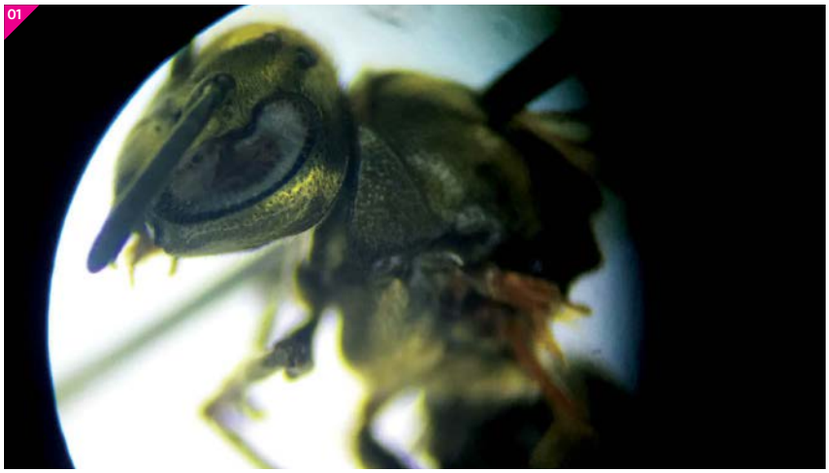
Software
ZBrush, Maya, Octane for Maya, NUKE, Photoshop

Learn how to
- Create a simple rig for an insect model
- Use Maya references
- Create Octane Shaders
- Render using OctaneRender for Maya
- Create lighting passes in OctaneRender
- Render Maya Paint Effects in OctaneRender
- Render motion blur in OctaneRender
- Composite lighting and shading passes in NUKE

Concept
I obtained a specimen of a Mexican honey wasp from an entomologist and studied it under a microscope. For lighting I used online references and my favourite macrophotography books.

YOUR FREE DOWNLOADS
from **filesilo.co.uk/3dartist**
- Video tutorial
- Tutorial screenshots

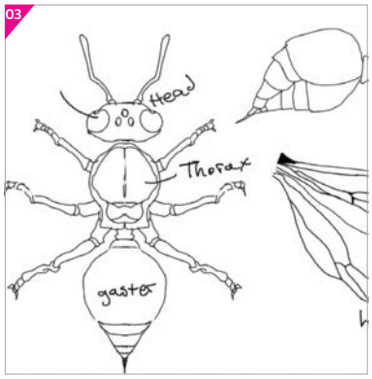
01 Obtain insect reference When you are trying to re-create something in nature, nothing beats having the real thing close at hand. Using a stereo microscope, you will be able to study the insect from multiple views and get a real sense of how the forms will work for you in 3D. Be careful though, a dead insect is not the same as a live one! Desiccation of a dead specimen can cause parts to shrivel a little and the colouration can then change. Make sure that you have access to photographic reference of a living version of the same species, in addition to any actual specimens that you may acquire.

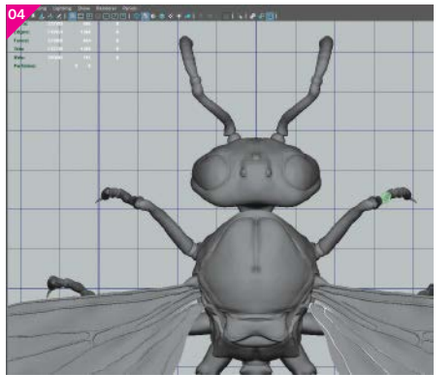


02 Study photographic lighting techniques Macrophotography uses specific equipment and techniques in order to visualise detail that is too small to be seen by the human eye. The subject itself moves quickly and unpredictably. Photographers have developed lighting rigs to minimise blur and maximise detail. CG artists often have the opposite problem: our models move very predictably and often look fake or dead as a result. There is no shortage of books, magazines and videos on the subject of macrophotography we can learn from.

Using Maya scene references
A scene reference is often a link to a rigged version of a model. When you change the rig in the reference, the linked version is automatically updated in the master scene. Create your insect model and rig in one scene and reference that file in a master animation or render scene. If you have animated the rig in the master scene you can still change the rig in the referenced scene.

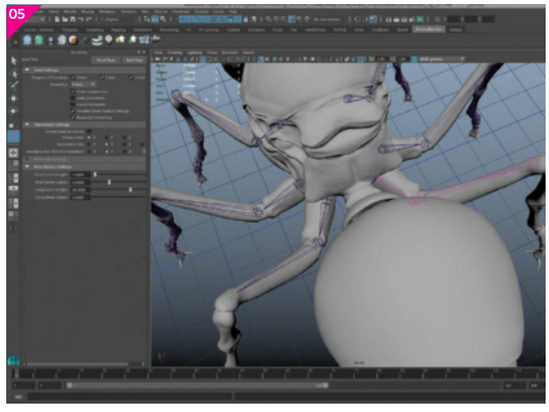
03 Create wasp drawings Matching a drawing in ZBrush is the best way to ensure accuracy. Draw what you can from your specimen or photos so you can sort out the various parts of the insect anatomy in your mind before modelling. Draw the side or top view and do a second drawing that maps out the wing vein pattern. Try not to make anything up.

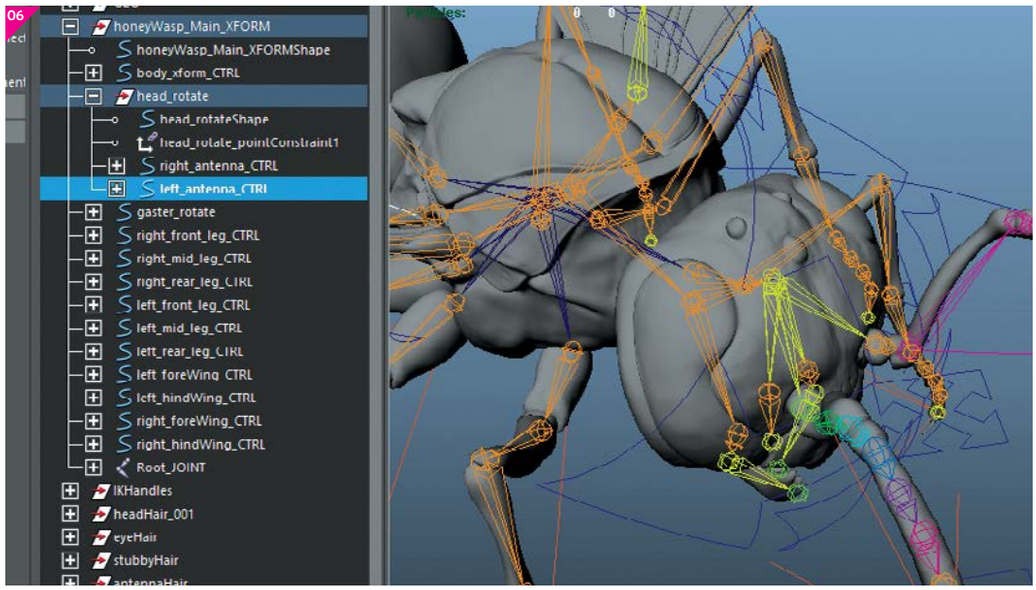




04 Organise your model Give each piece of geometry a proper name by finding diagrams of insect anatomy online with a convention like 'front_left_vein_GEO'. Group the parts of the geometry logically as well. Take advantage of Maya features such as 'Prefix Hierarchy Names' to speed up the process. Group UV shells based on the materials to be applied.

05 Add joints Use Joint to place joints. If you enable Projected Centering, the joints will try to snap to the centre of the geometry volume. This makes it easier to place joints in the perspective view. Enable Symmetry on the x axis so you can create joints for both sides at once. The Symmetry feature adds a constraint to the mirrored joint so that placement is symmetrical even as you adjust a joint's position.

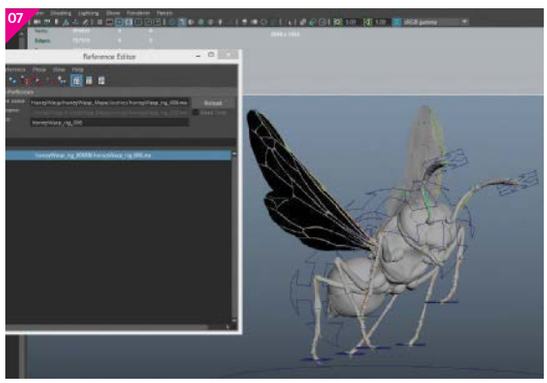


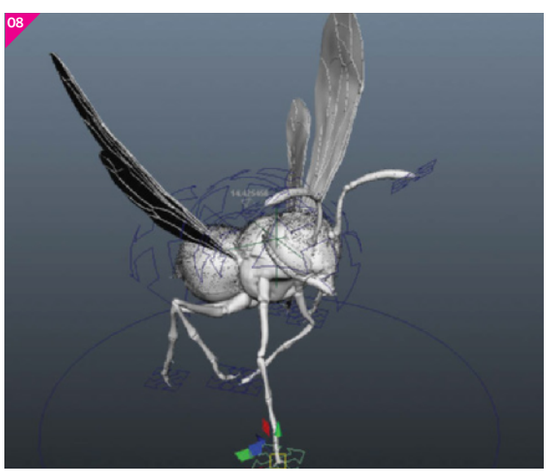


Octane geometry

Each piece of geometry in your scene needs to be set to the correct render type when using Octane (in the channel box under Shape node). If the geometry does not move in the scene, set its type to Global. For geometry that has keyframed translation or rotation, you can set the type to Moveable Proxy. If the geometry is animated using joints or deformers set the type to Reshapable Proxy. Particle instances are set to Scatter. All of the geometry of the wasp should be set to Reshapable Proxy.

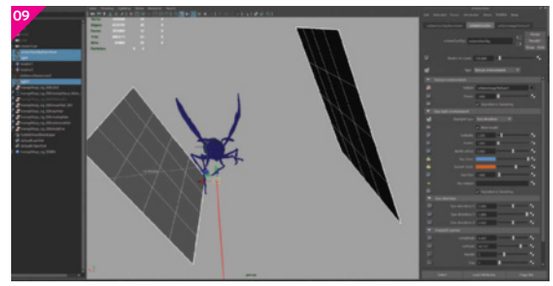
06 Bind the geometry and create IK controls Once the rig is set up, you need to name the joints! Skinning insect models is pretty easy, really: to reduce the need to paint joint weights, select a joint and the piece of geometry and use Skin>Smooth bind. In the options turn on Selected Joint so that only the current joint is included in the bind. For wings and antenna only bind the geometry to the necessary joints. Create IK handles for the legs and constrain the handles to a locator or curve for easy manipulation. For the head, abdomen and wings, create a forward kinematic control using curves and orient constraints.



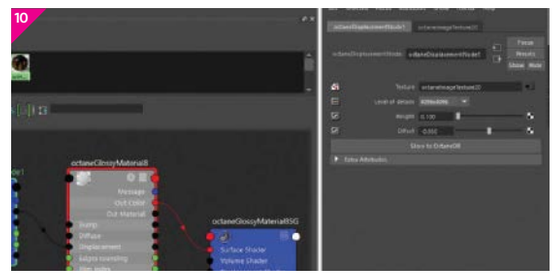


07 Create a master render scene The scene should contain just the model and rig, don't add any lights or materials. Save this scene and then create a new empty Maya scene. Use File>Create Reference to reference the file that contains the wasp rig. Create a camera and choose a view of the wasp. Use the rig to pose the wasp. You will add materials in the master scene, not the scene reference. This way if you decide that you want to have multiple scene references of the same wasp model in the master scene, then you can apply one set of materials to all of the wasps. This is a big time saver!

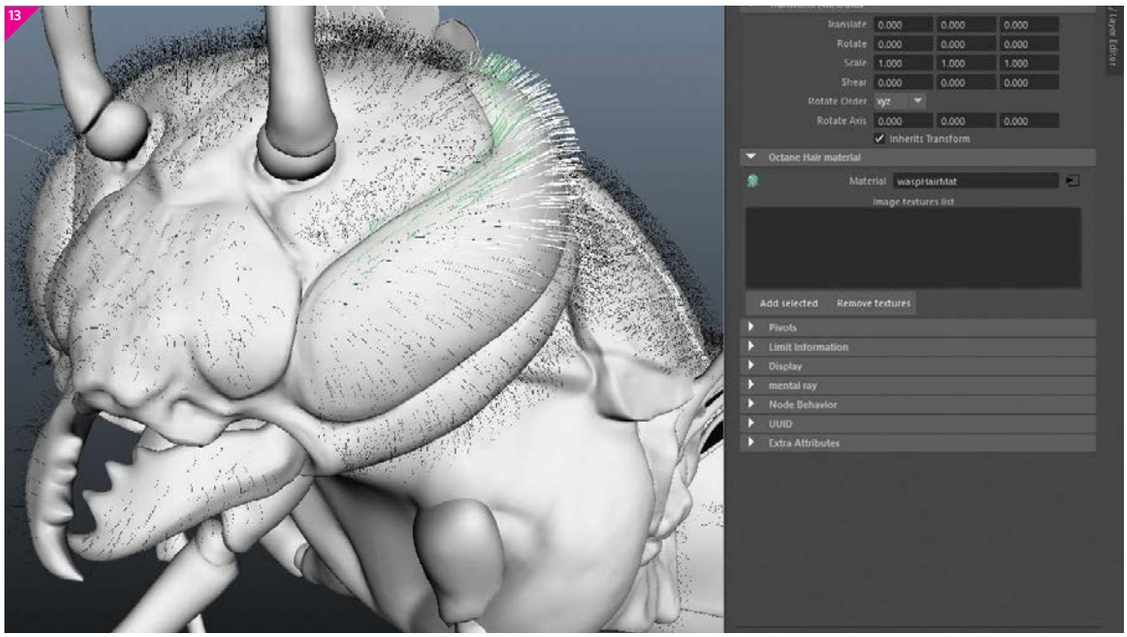
08 Pose the model Use the camera you've added to create a pleasing composition. Pose the insect so that you can see her best features. Make sure the silhouette still reads as an insect in flight. Make sure the legs don't appear too tangled and be mindful of negative space around the insect and between its parts. To animate the look of motion-blurred wings, keyframe the wings downward, move ahead two frames and keyframe them in the up position. On the Graph Editor, set pre- and post-key behaviour to Oscillate.



09 Set up basic lighting The lighting consists of three parts: one of these is an environment node to provide image-based environment lighting and two are large area lights. The area lights will simulate the flash arrangement used by macrophotographers in the real world. Photographers use flash to reduce exposure time so that the moving insect is clear. Create an environment node and use a spherically mapped image of a forest. Create two large planes and place them on either side of the insect with the positive z axis of the planes facing the insect.



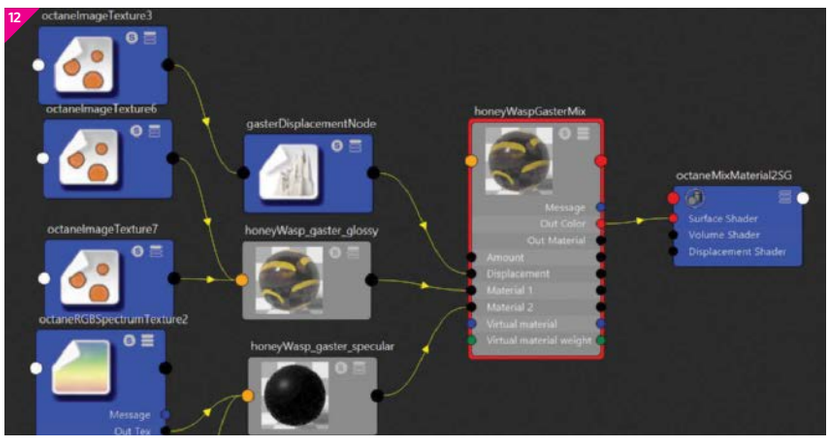
10 Test displacement maps In the Octane material attributes click on Displacement and choose Octane Displacement node. In the Displacement attributes, add an Octane Image texture. Use the Height slider in the Displacement node settings to adjust the strength. Set the offset slider to minus half of the height value when using greyscale displacement. The level of detail sets the quality of the displacement. In the Extra Attributes of the geometry set the Geometry type to Reshapable Proxy and increase the Octane Level to subdivide the model. Octane Displacement is so good you may not need to use a Bump or a Normal map!



13 Render Paint Effects in Octane

You can use Paint Effects to add hair to the insect. Use the short arm hair Paint Effects brush preset as a starting place to create hair. Paint these hair strokes on the surface of the body. Brush in the direction you want the hair to point. To render Paint Effects brushes you can just attach an Octane material to the Transform node of each Paint Effects stroke. This can take a while if you have a lot of strokes on the model. Try writing a simple MEL script loop to automate the process. Hair adds a lot to the realism of insects.

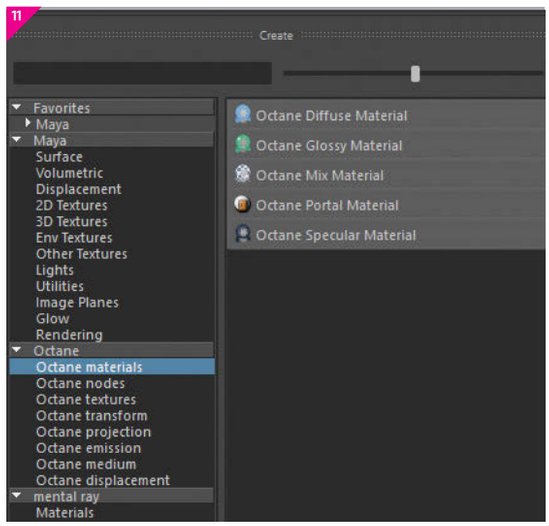
11 Octane materials Octane does not use Maya or mental ray materials, you have to use only Octane materials and shader nodes. There are four types: Diffuse, Glossy, Specular, Mix and Portal. Diffuse is for rough surfaces or light emission. Glossy is for most surfaces from plastic to skin. Specular is best for transparent, shiny and translucent surfaces. Mix material lets you blend other materials together and Portal is used when lighting interiors through openings such as windows. To create a subsurface scattering effect you can increase the transmission value and then attach a scattering texture to the Medium attribute of the Specular material.

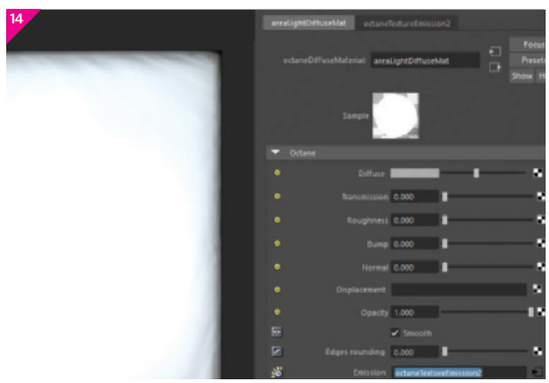


12 Octane Mix material Apply an Octane Mix material to the head of the wasp. Create a Specular and Glossy material and attach each to a material slot in the Mix shader. Connect a Displacement node to the Displacement field and use this to connect your Displacement map. Use the Mix slider to set the strength of the Spec or Glossy material. Make your Spec material translucent and the Glossy shiny. Apply an Octane falloff texture to the Mix slider and use this to set the strength of the Spec based on the incidence angle of the geometry.

Render motion blur

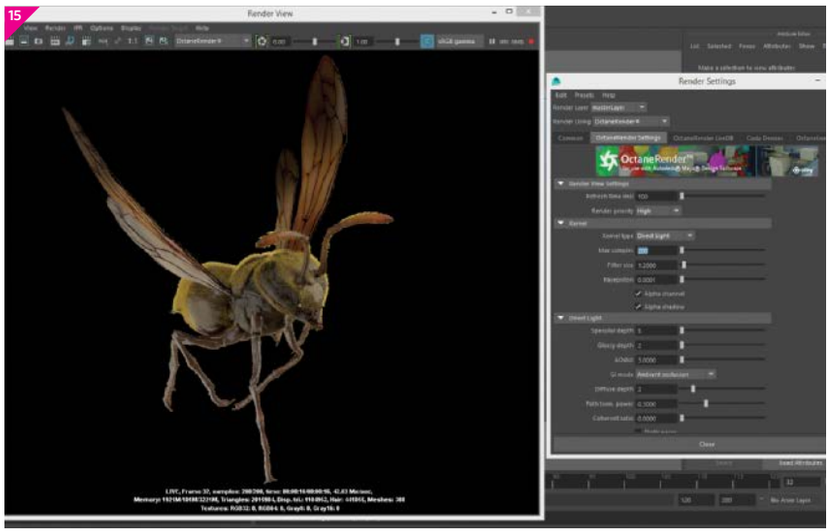
There are two types of motion blur in Octane: Internal and Subframe. Internal works for moving cameras and moving objects that are not deformed. Set the Motion Blur in the OctaneRender Settings tab of the Render Setting window. The Cam Shutter slider sets the speed of the shutter. Use Subframe Motion Blur when rendering deforming objects for the wasp model. Use the MB sliders to control the amount of blur. You won't see the motion blur when rendering in the preview window, only when you batch render an animation.



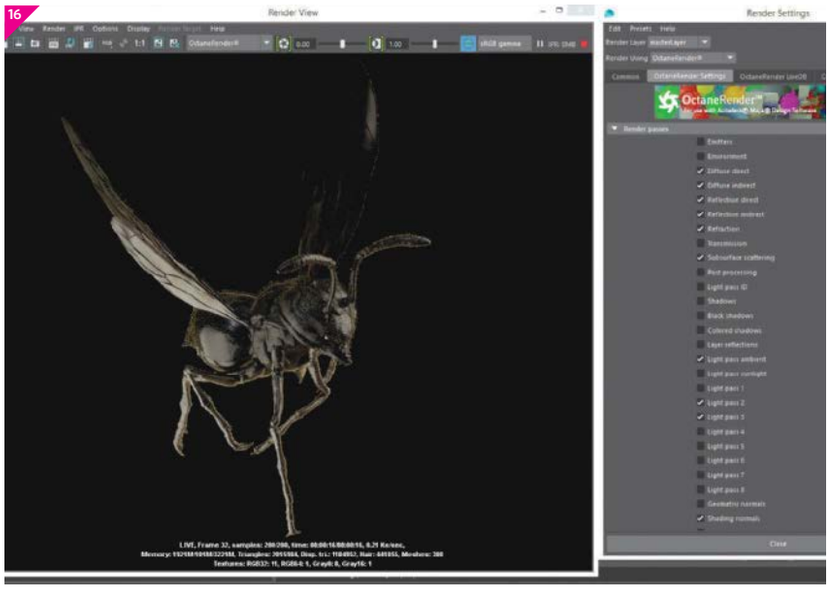


14 Realistic lights Apply a Diffuse texture to the polygon planes that represent the lights. Add an Octane Texture node with the button next to Emission in the Diffuse Materials Attributes. Use an HDRI of a light for the emission texture. The Power attribute controls brightness and efficiency to control falloff (low efficiency means faster falloff). A bright light behind the insect brings out the translucent quality of the surface.

To create a subsurface scattering effect, increase the transmission value and then attach a scattering texture



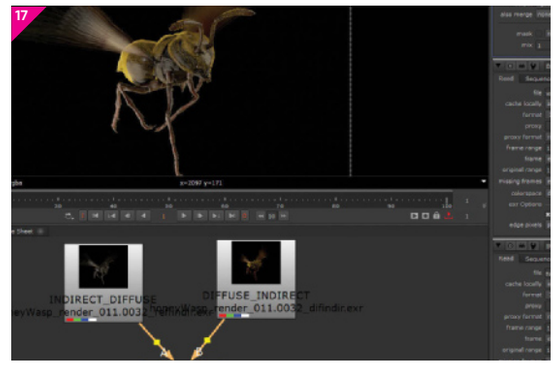
15 **Create test renders** Once you have the materials and lights set up you can start to tune the render. In the Render Settings make sure Octane is chosen as the renderer. In the Octane tab set the Kernel to Direct Lighting and Samples to 200. Open the Render View window and select a snapshot from the camera. Press the IPR button to view the render. It will take a few moments to compile the scene. The render view will update as you work in the scene but if you move geometry, you'll need to press the IPR button to recompile.



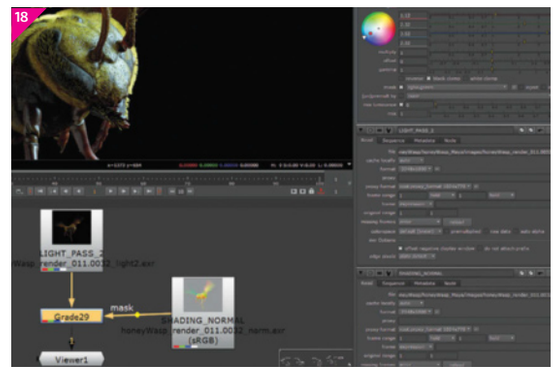
16 **Render passes from Octane** When you get something you like, increase the quality of the render by switching the Kernel to Path Trace or PMC. Increase the Samples to 2,000. Scroll down in Octane of the Render Settings windows and expand the Render Pass section. Click on the checkboxes to activate Render Passes. To view the passes, set Preview to the desired pass and press IPR to recompile the scene; you can use the preview render to switch between selected passes while rendering. To create a final render use the Batch Render option.

Setting up light passes

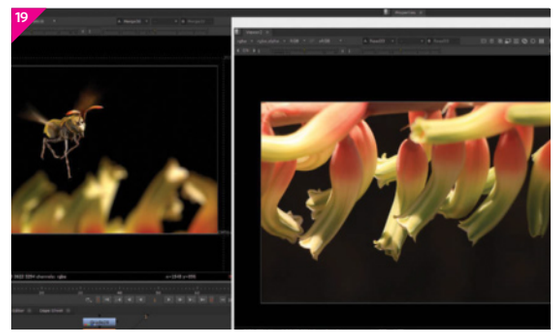
Light passes isolate the effect of individual lights on the rendered model. Duplicate the Diffuse material you've applied to the polygon planes and apply it to the other plane. In the Texture node for the emission texture set the Light Pass value to 2 for one of the planes and 3 for the other. In the Render Pass section for the Render Settings, enable Light Pass 2 and Light Pass 3. Render the scene. Octane will create separate images for each light pass. Use these images in the NUKE composite to fine-tune the strength of each light.



17 **Composite in NUKE** Open NUKE and import the images with a Read node. The simplest way to composite the render passes is to use a Merge node, eg to layer the indirect reflection pass on top of the indirect diffuse pass. Set the Merge operation to Screen and use the Mix slider to control the opacity of the indirect lighting passes. Try layering the subsurface pass on top of direct lighting and adjust the Mix to adjust the amount of subsurface scattering. Other nodes that sweeten the image include Glow and ZDefocus.



18 **Colourise lights** The Grade node adjusts the levels; place it below Read for one of the passes and use Gain to control brightness. Click on colour picker to tint the light. Render a shading normal pass from Octane and connect it to the mask of Grade, then set the mask to the red, green or blue channel of the normal pass. Layer the result into the rest of the script using Merge.



19 **Use a background image** To complete the composition try layering the rendered passes on top of a background image. A high-quality photo of flowers works nicely. Even a hint of colour behind the insect can add a sense of story to the composition. Use the Defocus node in NUKE to blur the photo – study real images of insects to see how photographers incorporate background into their work.

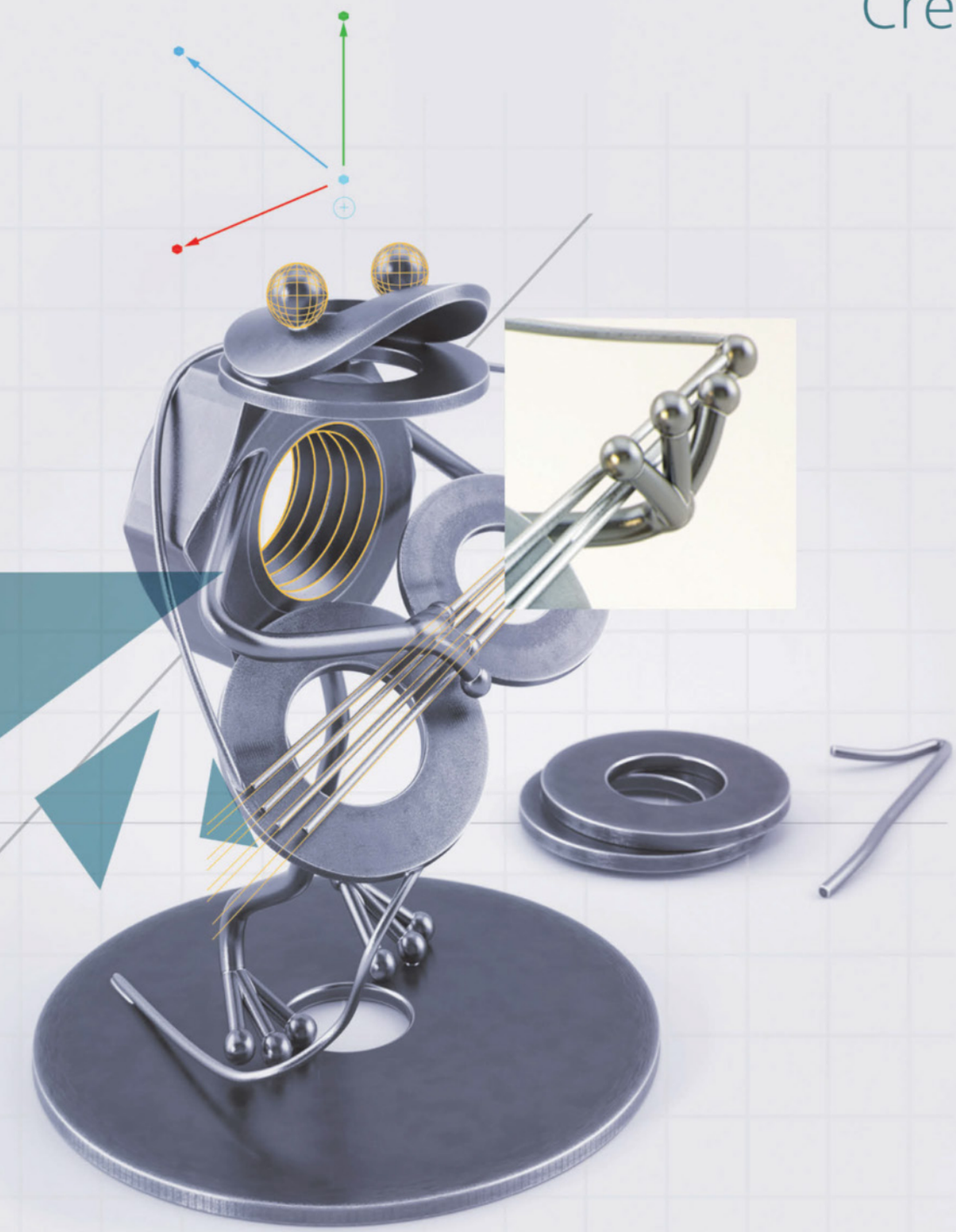
All tutorial files can be downloaded from: **filesilo.co.uk/3dartist**

THE FOUNDRY.

Image courtesy of Tomáš Sciskala

MODO® 901

Create Something.



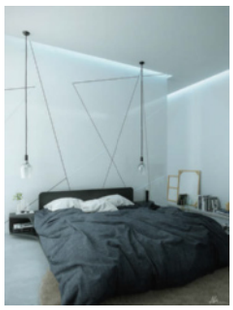
www.thefoundry.co.uk

ALEXANDRE JAREK
Penthouse, 2015

Software
3ds Max, V-Ray, Photoshop

Learn how to
- Gather arch-vis references for added realism
- Develop an interior concept
- Compose a scene in 3ds Max
- Set up realistic lighting
- Apply complex materials
- Finish up with Photoshop

Concept
The project is based on a previous project but is revised, more futuristic and less classic. For references I used existing architectural concepts and interior designs. In this particular scene I thought about playing with a corrugated multiframe wall created by Geometrix Design and developed a bedroom.

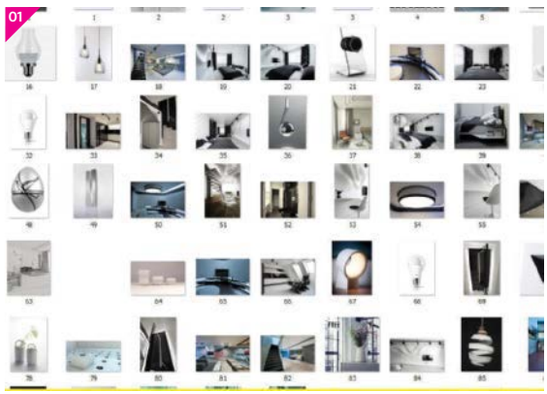


YOUR FREE DOWNLOADS
from **filesilo.co.uk/3dartist**
- PSD (8K) file
- Tutorial screenshots

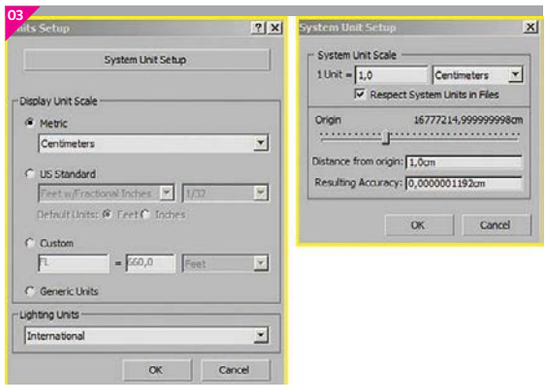
Render a realistic interior scene

Learn how to model and light a penthouse based on several references for a realistic result

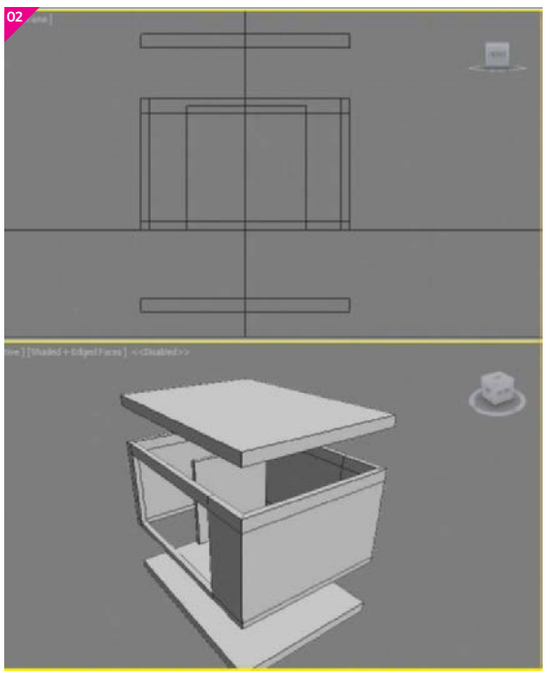
The main purpose of this tutorial is to provide you with the essential steps of a workflow for when you're working on a conceptual and realistic interior scene. We will start with the concept and the modelling part using 3ds Max then focus on the texturing part, create realistic shaders, and then we'll learn about the lighting and rendering processes. We will end this journey with post-production processes using Photoshop. This project was proudly supported by RebusFarm (**rebusfarm.net**) – thanks for your help in the rendering time!



01 Initial workflow At first you need to develop your concept and focus on the main result that you are trying to achieve for your scene. Observation is crucial and gathering reference images will help you to identify your concept needs, how you will incorporate them into your scene and how you will organise your workflow around that. Of course it is up to you to determine how detailed you want your scene to be, but it is important to observe the real world when attempting to re-create a scene.



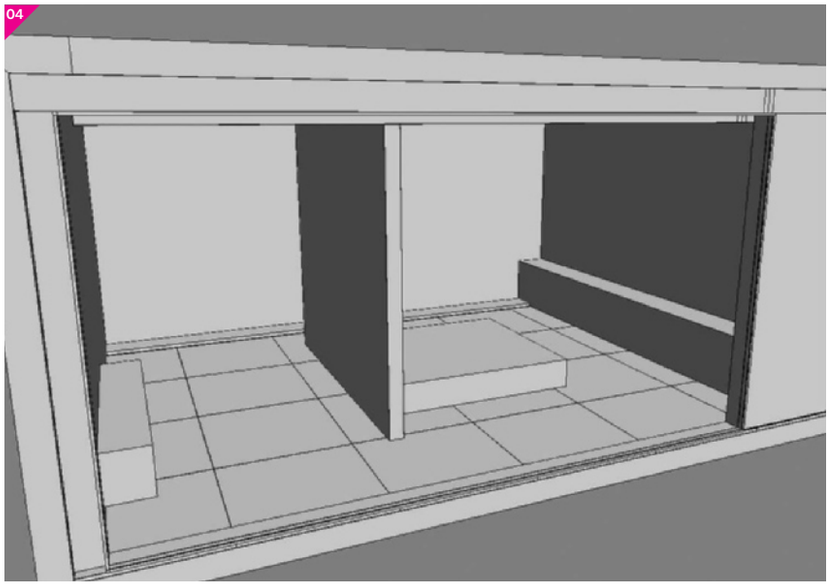
03 Real-world references Remember that when working with 3ds Max you should always be working with real-world units and using correct gamma. This is very important, especially when trying to achieve a photorealistic render. In our workflow, we use cm units and a 2.2 gamma value (meaning we're currently working with linear workflow).



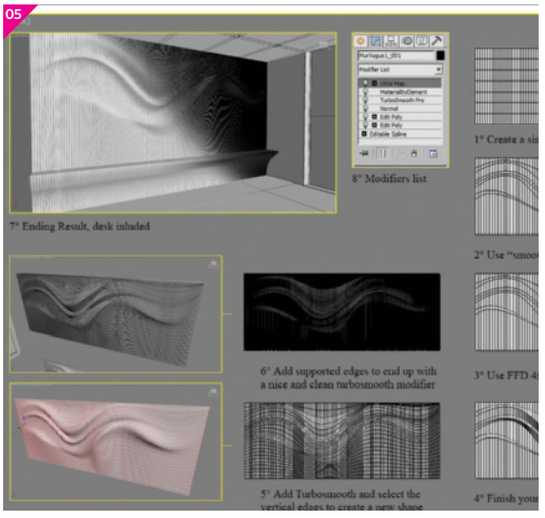
02 Organise the modelling When your research is done you should be able to easily split your modelling process into different parts, so start by delimiting the space and the architecture using simple boxes. For example, you can split it into Main Structure>Architectural details>Decorative parts and so on.

Add details to your interior
When your objective is to provide a realistic result, the first thing to know is that there is no such thing as perfection in the real world. This may be applied onto the geometry you're working on but also when placing objects in your scene. That is why we would recommend not using perfect angles when compositing your final interior scene. Also, geometry will add details to your scene but meshes do not need to be highly detailed if they won't be seen in the camera. Therefore, it is up to you to determine where you want to put more details.

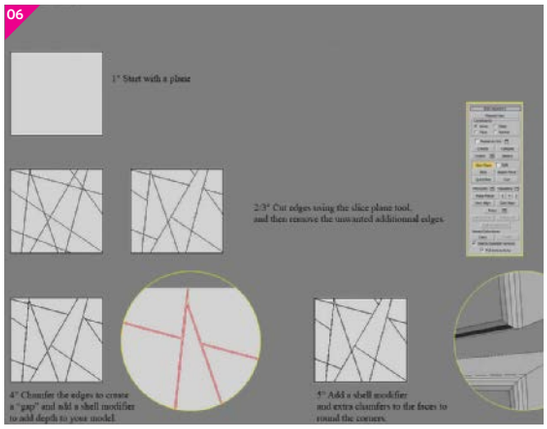
> Remember that when working with 3ds Max you should always be working with real-world units and using correct gamma



04 **Tweak the architecture** Develop the architecture by adjusting the walls, adding the floor and delimiting the windows, doors and so on. At this point you need to focus on the main structure and keep it as simple as possible by using a very basic poly edit method so you can quickly arrange your design and figure out how you will composite the different elements of your scene.

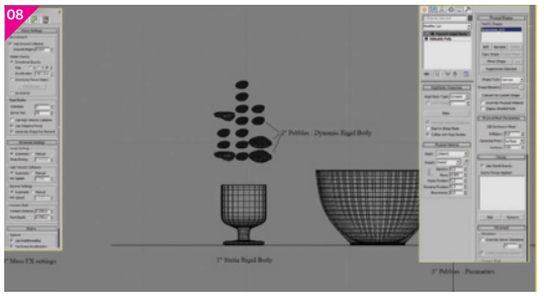

8° Modifiers list
7° Ending Result, desk inluded
6° Add supported edges to end up with a nice and clean turbosmooth modifier
5° Add Turbosmooth and select the

05 **The multiframe wall** This is one of the main parts of this interior project. We had to generate a detailed mesh but we also had to be able to modify it if needed. So how can we reproduce it and keep it simple and easy to adjust at the same time? Well, by using a standard primitive and adding simple modifiers. We also used a script to simplify the task called Smooth Edges, developed by Marius Silaghi. This script gives you more control to the edges that you want to be curved.


06
1° Start with a plane
2-3° Cut edges using the slice plane tool, and then remove the unwanted additional edges
4° Chamfer the edges to create a "gap" and add a shell modifier to add depth to your model
5° Add a shell modifier and extra chamfers to the faces to round the corners

06 Geometric cutout We mentioned above that there are several ways to create specific structures. It is best to start with a standard primitive to easily tweak and gradually reveal the details you're looking for. Start with a basic plan and cut edges to define your rough shape. Chamfer those edges to delimit the polygons that will be extruded. Try to use modifiers as layers and keep them in the stack for future modifications. Do note, though, that keeping all the modifiers in the stack is pretty RAM-consuming. We would recommend collapsing the stack when you're satisfied with your final geometry.

> "There are several methods you can use for generating carpets, such as V-Ray displacement, Hair and Fur or even scattered carpet patch"

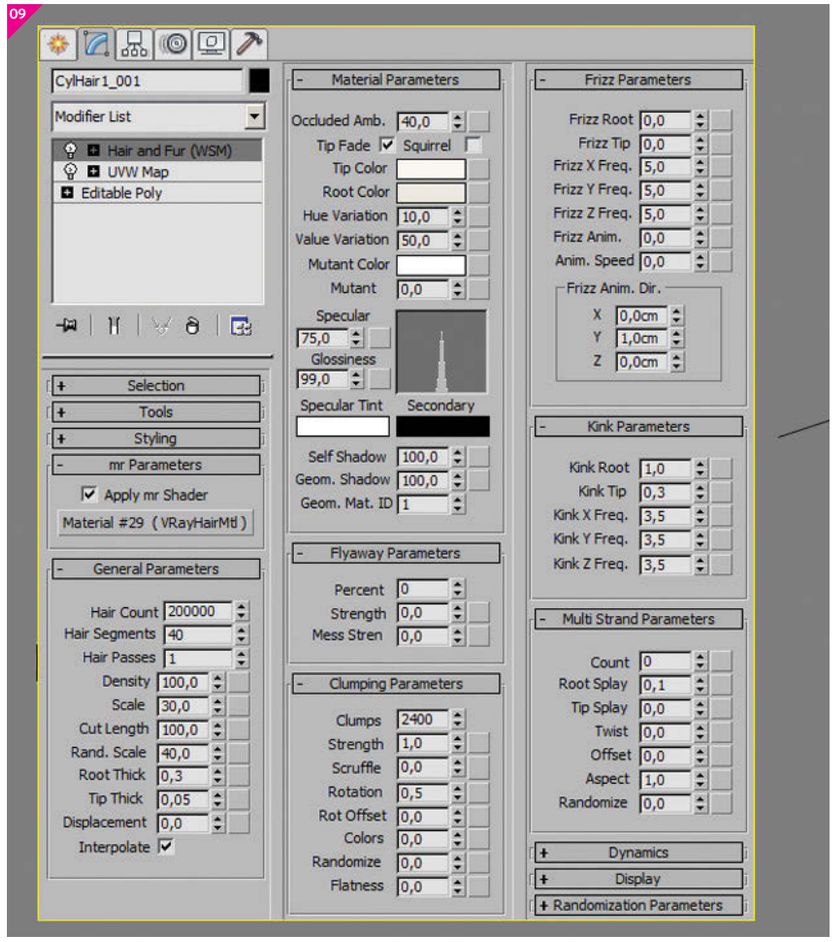


08 Mass FX plugin We used Mass FX to fill a cup of glass with pebbles. Enable the Mass FX Toolbar to gain access to the full parameters list, then select the object you want filled and set it as a 'static rigid body'. This creates a web; adjust its shape by setting it as concave and regenerate the mesh. Create three variations of pebbles set as 'dynamic rigid body' objects. You will need to adjust default parameters if you want a realistic result. Once you're done, bake keyframes and delete the keynotes with this code: 'deleteKeys objects #allKeys' and turn the geometry into an editable poly.

Realistic lighting

Once again, take a look at real-life lighting and how the natural light can affect a closed space. When creating soft lighting in an interior you need to first analyse your scene in order to predict how the light will be distributed and where you'll need support lights to brighten up shadow areas.

07 Add decorative objects When doing arch-vis, use plausible and ergonomic design. Running areas should be at least 70 or 80cm wide, the space between the floor and ceiling about 270 or 280cm high, and doors about 200 or 210cm high. Let's add furniture and arrange them in an organised mess. Basic tools like the Editable Poly modifier, Shell modifier, Chamfer and Extrude have been used to design the objects.



09 Hair and fur There are several methods you can use for generating nice rugs and carpets, such as V-Ray displacement, Hair and Fur or even scattered carpet patch. In this particular example we used the Hair and Fur method, which works well for simple shaggy carpets. It allows you to control different properties of the hair and also features interactive brushing and built-in hair materials.

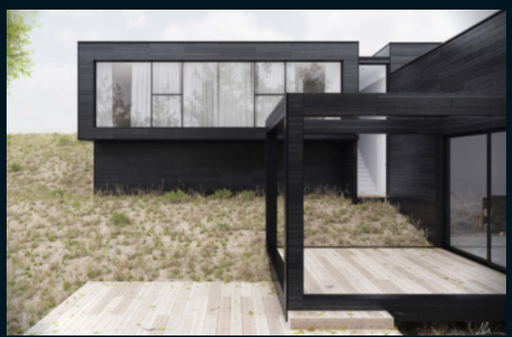
Showcase

Alexandre Jarek

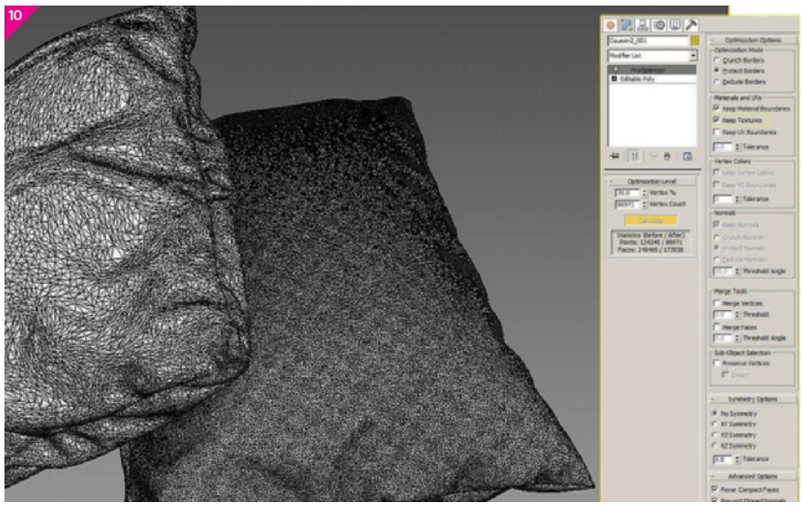
I'm currently working for an architectural firm based in Geneva (Switzerland) as a 3D artist. I started doing 3D about four or five years ago, in 2010 when I was at university. At this time I studied Interior Design. I learned it mostly on my own and thanks to the internet, I found thousands of tutorials and making-ofs.

La maison d'inspiration IKEA **3ds Max, V-Ray, Photoshop (2014)**
This project is based on photos from IKEA's catalogue. The main theme of the project was to create a classic interior scene and match the reference images.

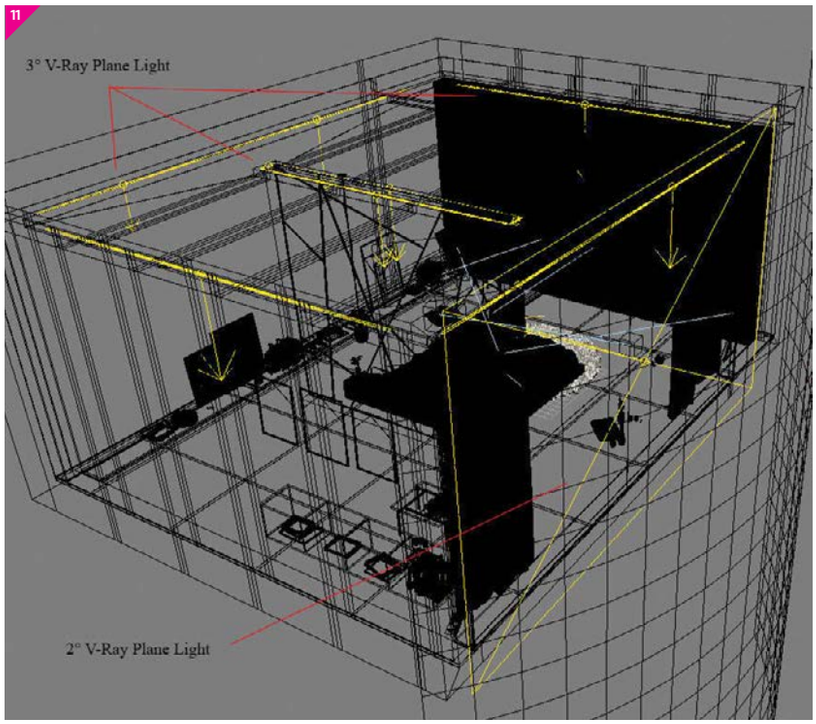
Rear window | Fenêtre sur cour **3ds Max, V-Ray, Photoshop (2011)**
This scene is a study of materials and textures. I wanted to create a bright scene using natural light. The ambience was inspired by Scandinavian interior design.



Ridge road residence | Résidence route des crêtes **3ds Max, V-Ray, Forest Pro, Marvelous Designer (2013)**
The original concept comes from architects Studio Four (studiofournews.com). The modelling process was pretty standard. The hardest part was to re-create the environment and adding some personal touches.



10 Optimisation When working with a very dense mesh, it is a good idea to optimise it to encourage easy navigation in your viewport. For that, we will often make use of the ProOptimizer modifier. If the model already has UV coordinates then ensure that you do not forget to tick the box for Keep Textures.

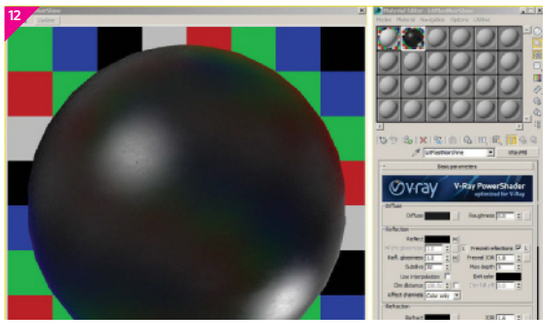


11 Lighting with V-Ray The natural light used is a V-Ray Dome light with an HDRI map. The light enters the scene through the large window. Since the HDRI contains a huge amount of information on colours, intensity and more, it can be used to reproduce sunlight. We also added a V-Ray light plane to generate a general lighting setup for the scene, avoiding hard shadows coming from the exterior through the window. Once we were satisfied with the parameters, we added artificial lights since we wanted a specific atmosphere.

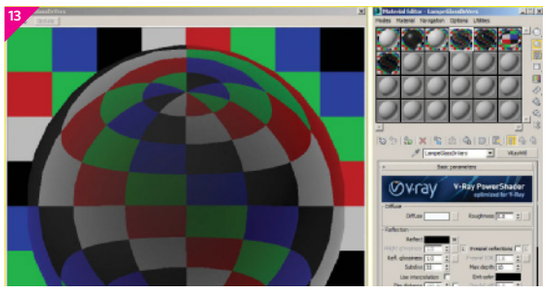
Creating materials

When it comes to bringing photorealism into your renders, the use of lights and materials can provide you with 90 per cent of the effect. The process of creating realistic and convincing shaders has now become a very important step of a 3D artist's photorealistic rendering workflow.

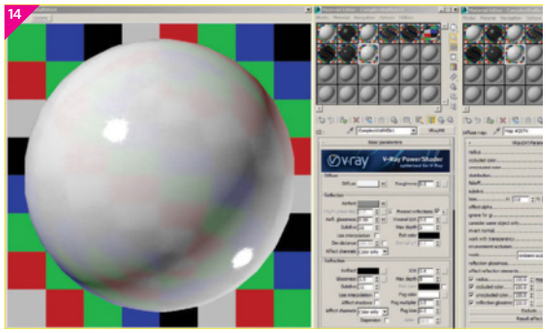
> When working with a very dense mesh, it's a good idea to optimise it to encourage easy navigation in your viewport



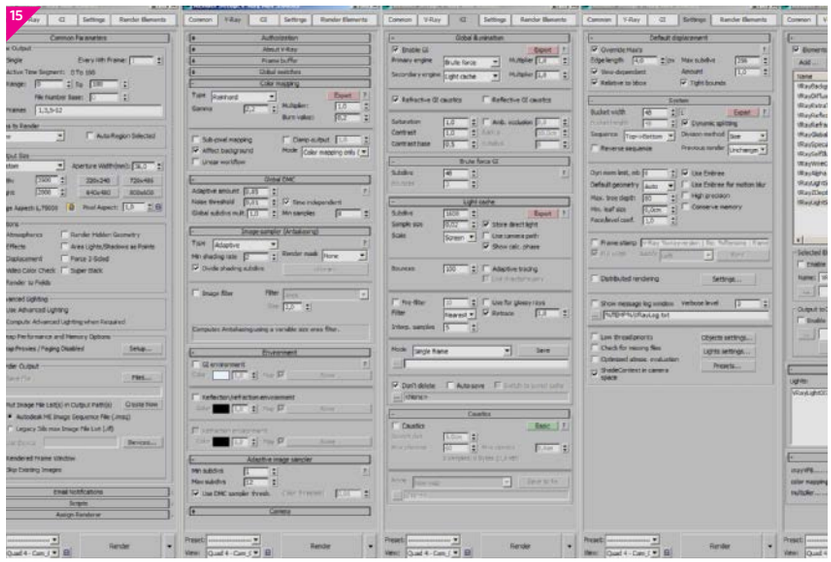
12 V-Ray material V-Ray was used as a render engine, meaning that we also used V-Ray Materials to generate realistic shaders. Around 90 per cent of the scene uses simple V-Ray materials, the rest was composed. There were a few exceptions, like curtains being made with VRay2SidedMtl, illuminated objects made with V-Ray light materials and so on. The trick here is to define the amount of reflectivity of your object, its mode of reflection, fresnel, surface quality and so on. All of that can be seen by observing the real world and searching for material references.



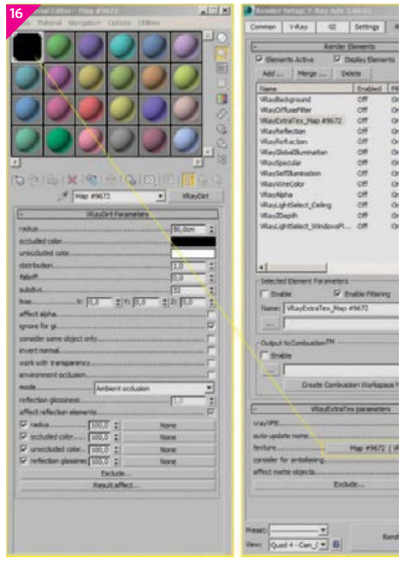
13 Translucent materials We used several variations of glass, crystals and plastics that are transparent or semi-transparent. In V-Ray, the amount of transparency is given by the Refract slot in your Material Editor. Pure black makes the material 100 per cent opaque and pure white makes it 100 per cent transparent. These are the basic parameters, but there are values adjusted for more details.



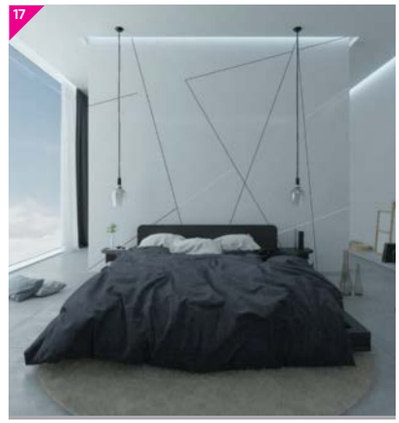
14 Photorealism V-Ray dirt material is a powerful tool when simulating photorealistic details in your scene. The procedure is pretty simple and easy to apply. First, test your dirt amount if you're distributing it with a texture. Keep in mind that dirt is very rarely uniform in the real world. Using textures as the dirt amount is a good way to reproduce it. Once you are happy with the way that the dirt is affecting your material then you can finalise the shader by filling the Occluded and Unoccluded slot.



15 Render settings In order to achieve increased realism and avoid artefacts we use the universal method: brute force and light cache. There is no special trick in our render settings but we would recommend you enable Render Elements as a key part of your compositing process. You will be able to increase or decrease reflections, refractions and so on. Now add ambient occlusion, depth of field and so on.



16 Ambient occlusion Our AO maps can be achieved by adding VRayDirt as a texture with a 50cm radius and subdiv at 32. Then we use WireColor to select objects by materials. For this particular element we used the Random Wire Color Tools created by David Mackenzie.



17 Post-production V-Ray offers the possibility to break down elements that compose your raw render, so you can adjust your final output. We believe that, in the architectural field, and when producing stills, post-production is a must for highlighting your render and not to correct errors that could have been fixed before. In Photoshop, gather all elements in one stack, saved as EXR in 32-bit float. Final touches include colour corrections, sharpness with the high-pass filter and adding vignetting.

V-Ray camera

The VRayPhysicalCamera is a simulation of a traditional camera and its parameters are clearly understandable. Unfortunately the art of photography is too broad to be written in a single paragraph but you may find it useful to take a look at different tips and tricks on composing photos with some of the guidelines in photography, like with Rule of Thirds, diagonals and so on. We strongly recommend the ImageCompHelper script that was developed by Christoph Bülter (**bit.ly/1iptVyr**).

Lenovo® recommends Windows.

lenovo

MAXIMIZE USER PRODUCTIVITY

LENOVO THINKSTATIONS ARE BUILT FOR PERFORMANCE AND RELIABILITY.

TOOL-LESS DESIGN | SIMPLIFIED MODULAR ARCHITECTURE | HIGHLY SCALABLE | ISV CERTIFIED

Delivering breakthrough levels of pipeline efficiency with up to 96% more performance than previous generation workstations, **Lenovo ThinkStation P Series** are powered by Intel® Xeon® processor E5-2600v3 series **and** the latest NVIDIA Quadro® professional 3D graphics; enabling them to run faster than ever before. **Empowering visualisation professionals with serious amounts of processing power for their rendering workflow.**

UNCOMPLICATED USAGE
- Tool-less and cable-free design
- FLEX features and intuitive touch-points
- Easy configuration and customization

INTELLIGENT COOLING
- Patented tri-channel architecture
- Our coolest workstations with just 3 system fans reducing downtime and maintenance

UNMATCHED PERFORMANCE
- Up to 4x high-end NVIDIA graphics cards
- NVIDIA Quadro® and Tesla® GPU options
- Quad Channel DDR4 Memory
- Supports up to 14 high performance storage drives

FOR THOSE WHO DO.

NVIDIA®

sales@thinklogic.co.uk
0845 475 1155

thinklogic

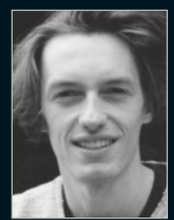
www.thinkworkstations.com

Lenovo makes every effort to ensure accuracy of all information but is not liable or responsible for any editorial, photographic or typographic errors. All images are for illustrative purposes only. For full Lenovo product specifications visit www.lenovo.com Lenovo makes no representations or warranties regarding third-party products or services. Trademarks: The following are trademarks or registered trademarks of Lenovo: Lenovo, the Lenovo logo, For Those Who Do and ThinkStation. Microsoft and Windows are registered trademarks of Microsoft Corporation. Other company, product and service names may be trademarks or service marks of others. ©2015 Lenovo. All rights reserved.

Technique focus

Incredible 3D artists take us behind their artwork

VOLUME SCATTERING When you want to art direct a mathematical noise pattern, things can get tricky. I worked around this by creating a couple of ramp projections which pipe into an alLayerColor node (from Anders Langlands' shader library). By doing this I can place my ramp projections (3D gradients from a point) where I don't want any smoke.



Zeno Pelgrims
zenopelgrims.com

Zeno is from the UK and is probably waiting for some uncompleted render buckets

Software Maya, ZBrush, MARI, Arnold, NUKE

Path Tracer, 2015

SPECIAL OVERSEAS OFFER

SAVE UP TO 17% ON A GIFT SUBSCRIPTION THIS CHRISTMAS

ALL TITLES JUST £49.99

REAL CRIME
Uncover the most fascinating and notorious true crimes in history
13 issues, save 4%

HOW IT WORKS
The action-packed science and technology magazine
13 issues, save 10%

- **EXCLUSIVE CHRISTMAS OFFER**
- **SAVE UP TO 17%** ON THE SHOP PRICE
- NEVER MISS AN ISSUE OF **YOUR FAVOURITE MAGAZINE**
- **FREE E-CARD** TO SEND WHEN YOU BUY AS A GIFT
- **IDEAL CHRISTMAS GIFT** - THAT LASTS ALL YEAR

ALL ABOUT HISTORY
Bringing history to life for the whole family
13 issues, save 15%

GADGET
Packed with the latest, coolest and most exciting tech
12 issues, save 17%

TV'S STEVE BACKSHALL SPEAKS OUT FOR SHARKS
World of Animals
MASTER OF THE SKIES
AFRICAN SAFARI
JOURNEY TO KENYA FOR A WILDLIFE ADVENTURE
UGLY DUCKLINGS

WORLD OF ANIMALS
Everything you need to know about the world's most amazing wildlife
13 issues, save 4%

HISTORY OF WAR
The stories, strategies, heroes and machines of historic conflicts
12 issues, save 17%

FIND OUR FULL RANGE OF TITLES AT THIS **GREAT PRICE ONLINE!**

ONLINE AT

www.imaginesubs.co.uk/xmas151

ORDER HOTLINE

+44 (0)1795 592 869

BUY AS A GIFT OR TREAT YOURSELF!

Use code **XMAS151** for this extra-special price.

DIGITAL PHOTOGRAPHER
Inspiration, tutorials and tools for enthusiasts and professionals
12 issues, save 17%

RETRO GAMER
The number one magazine for classic gaming
12 issues, save 17%

ALL ABOUT SPACE
Discover the wonders of the solar system and beyond
13 issues, save 15%

SCIFINOW
The number one magazine for sci-fi, fantasy and horror fans
12 issues, save 17%

Our experts

The best artists from around the world reveal specific CG techniques

KeyShot, Photoshop
Pablo Castaño Norkus
facebook.com/eletecedateando

Pablo is a concept artist, 3D/VFX designer currently working in TV, videogames and film

3ds Max, V-Ray
Vikrant Dalal
project01studio.blogspot.in

Vikrant has several years of experience in VFX. His company Project01 Design produces 3D tutorials

Blender
Sean Kennedy
openvisualfx.com

Sean is a compositor working at CoSA VFX. He previously worked at Rhythm & Hues and others

YOUR FREE DOWNLOADS
from **filesilo.co.uk/3dartist**
- Tutorial screenshots
- Final image (6K)
- Video tutorial

KEYSHOT, PHOTOSHOP

Create a dust effect in KeyShot and Photoshop

In ancient Japan, it is said that woodcrafters spent the first half of the day sharpening their tools and only the remaining time actually 'working'. For us, software is our tool, and acquiring new techniques is the way we 'sharpen' ourselves. With that in mind we are going to bend the rules a little. Have you ever generated a fake Ambient Occlusion pass in KeyShot and used it to mask an image? Have you ever used a stone to create a dust effect on a surface? No? Well, today is the day!

Everyone knows that KeyShot and Photoshop are great pieces of software and if we can learn to bend the rules a little, we can achieve greater results. We'll be expanding the techniques that come from an artist called Scott Robertson. Sadly, KeyShot does not have many options in terms of render passes, but if we use our imagination and a few tricks we can take this software to a whole new level. Of course, this is not a modelling tutorial, so you have to have a model to mess with. It can be a freebie from the internet or a simple sphere, but we do recommend you start with something a bit more fun than a sphere.

First we are going to set up some renders in KeyShot with different materials and render pass configurations. Once the images are ready we will jump into Photoshop to clean them up and stack them in a unique PSD. Be aware that this technique is going to be used for a car model, but you can use it for environments, characters, machinery and more – it can be modified to fit the requirements of most models or scenes.

If you are not a huge fan of creating UVs or need to create one-shot concept art pieces, you will love this technique.

01 Render the base model First of all import your model into KeyShot. You can import it from your hard drive using File>Import or you can use the Bridge functionality of ZBrush. Once you are happy with the angle and placement of the camera, freeze it using the Camera panel. This is very important as we are going to create several renders with different materials and all of them have to match exactly, one over the other. Select an environment, dragging it from the menu (choose a dusty one!) and apply the materials that you like for your model. Now, render the image adding the clown pass in the render dialog.

02 Render the dust and the AO passes

We are ready to create our dust render. Select the Travertine Beige material from the Stone menu in the material tab and apply it to the whole model. We used that material in order to match the ground colour of our environment, but you can choose the one that fits your situation – just consider that the material has to be a non-reflective one. Tweak the colours of the material to better match the ground colour. Disable the clown pass and render the image. For the AO render, drag and drop on to the scene the all-white HDRI and the Paint Matte White material on the model. Render the image.

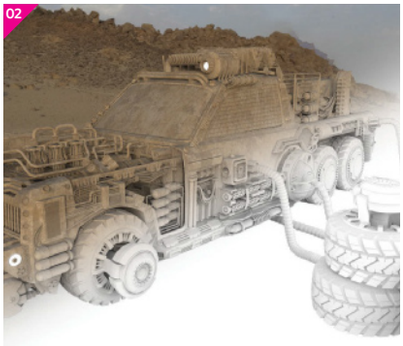
03 Prepare the layers in Photoshop

Once in Photoshop, open the four images (main render, dust pass, AO pass and clown pass) and stack it all together in one PSD. Select the clown pass layer and with the magic wand tool mask the background (black). With that selection, select the dust pass layer and hit delete, as we only need the background of the main render. Erase the AO pass background too using the same selection. You can adjust the tolerance of the magic wand to be sure that none of the background escapes the cleaning. Now select the dust layer and press Cmd/Ctrl+J three times (we need four dust layers in total).

04 Base effect and first dust layer

Select one of the dust layers and hide the others. Create a Mask Layer and, with the gradient tool, draw a few strokes in using black in the top part and then using white in the bottom. This is going to create the appearance of dust in the bottom of the model that slowly disappears towards the top of it. Reveal another layer of dust and create a black Layer Mask for it. Set white as your foreground colour and paint with a soft (or textured) brush on the layer mask to reveal the dust layer. Don't paint everywhere! Analyse your model and use online references to learn about how real vehicles collect dust.

02



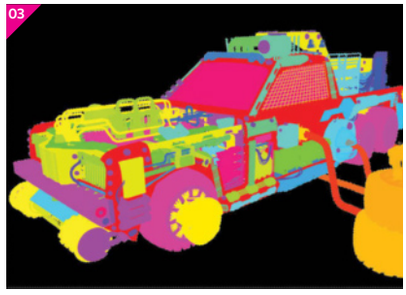
05 Detail the dust and use the AO pass

If you want to emphasise the dust effect on certain parts of the image you can lower the opacity of the last dust layer that we made, reveal a fresh one, and repeat the process, painting on some of the areas that you need to draw some attention to. For the next layer, select the AO pass and invert (Cmd/Ctrl+I), select the whole image (Cmd/Ctrl+A) and copy it (Cmd/Ctrl+C). Show the last dust layer and click on the Quick Mask Mode (below the tool bar) and paste the AO (Cmd/Ctrl+V), disable the Quick Mask Mode and press the Layer Mask button. This creates a sort of cavity pass, where the dust rests in the cracks and the occluded parts of the geometry, right in those hard-to-clean cavities.

06 Final adjustments and post-production

Of course, you can erase parts of the layers and play with the opacity of the layers to achieve better results. If you need to completely erase the dust from one of the objects in your scene, you can use the clown pass to select the object by colour and fill with black region on each dust layer mask. Colour grade the image, add in some atmospheric effects, flying dust, a nice vignette, your signature and you're good to go.

03

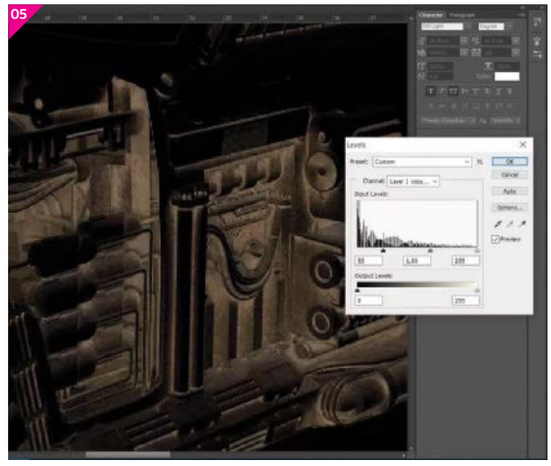


The importance of references

It's very useful to base your designs in the real world (even if you are creating something alien). For this tutorial I downloaded pictures of vehicles running through the desert. That helped me to understand the distribution patterns of the dirt over the different parts of the vehicle. Before you start every project, take a few minutes to find nice references and learn from real objects. You'll not only save a lot of time, but you will also bring a new level of realism to your images.

04

05



06

3DS MAX, V-RAY

Create tennis ball fur in 3ds Max using VRayFur

In this tutorial we are going to take a look at how you could make tennis ball fur, but also you can use the technique detailed here to make other elements, for example grass, hairs, animal fur and so on.

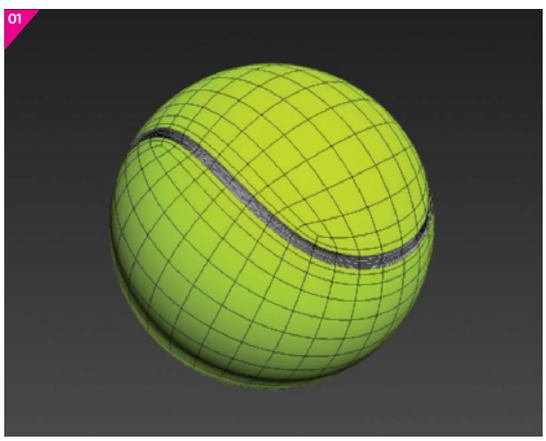
There are a number of 3D apps available to help us make the fur effects, for example Maya Hair, Hair Farm plugin for 3ds Max, VRayFur for 3ds Max, 3ds Max's own Hair & Fur modifier and so on, but we are going to use VRayFur which is part of the V-Ray plugin. It has fewer options in comparison to the others, but it can provide us with good output.

Before you start working on this kind of effect, you should know what tennis ball fur looks like. Download reference images from the internet or even buy a ball to get some better understanding, because tennis balls have different types of hair or fur: some of the fur can be very short but with huge fur counts, some can be medium-sized and some can be lengthy with lots of curls but with less fur count. So, it's better for us to see the reference images before we start working on the actual scene.

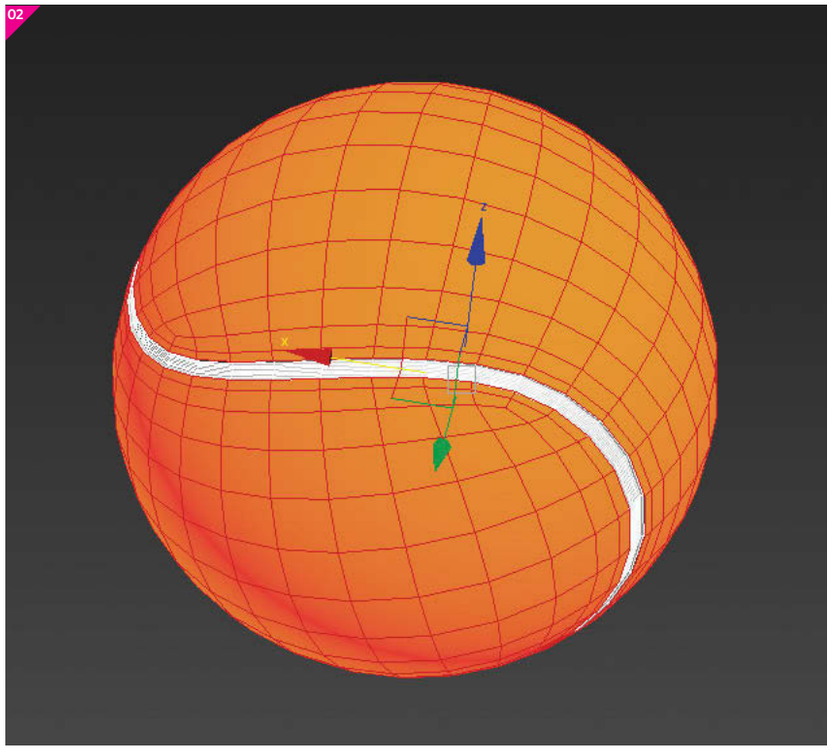
We can't teach you each and every parameter of this plugin though. As far as the tennis ball fur is concerned we will learn as much as required for this particular tutorial only.

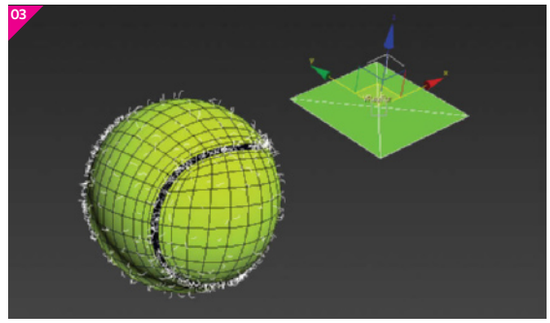
This is a very interesting subject, because you can't define one certain process for creating this effect, so you can try as many options available to you to get more options for better output – it very much depends on your own understanding of using tools and techniques.

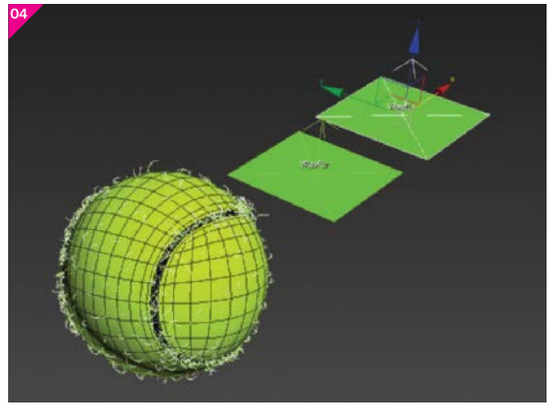
01 Create the tennis ball There are many video and written tutorials available on the internet about making tennis ball geometry – it's a very simple process. So you can refer to those tutorials or you can watch the video tutorial about making tennis ball geometry, which we have provided with this tutorial on the 3D Artist FileSilo page.



YOUR FREE DOWNLOADS
from filesilo.co.uk/3dartist
- Tutorial screenshots
- 3ds Max File
- Video tutorial

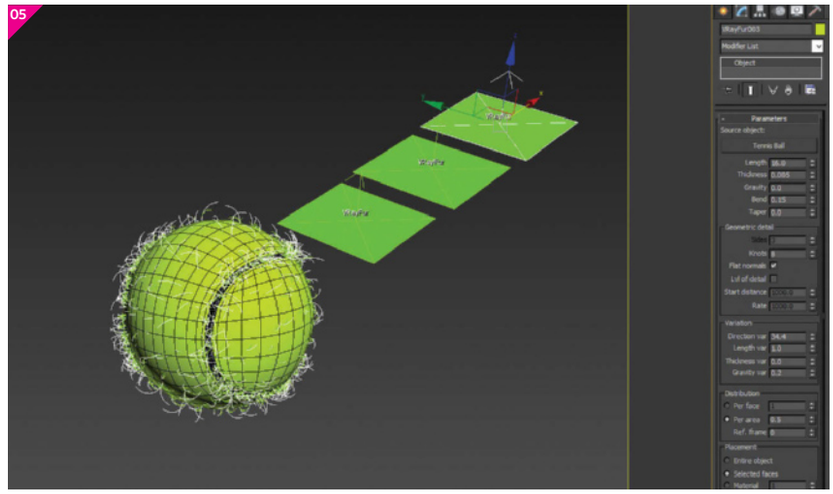






3ds Max Hair and Fur modifier

In this tutorial we have learned about the VRayFur plugin, but as you know 3ds Max itself has its own Hair and Fur modifier, which has many options and parameters to give you the best output possible. We'd suggest that after finishing this tutorial you should try out that modifier to understand 3ds Max's Hair and Fur properties and behaviour.



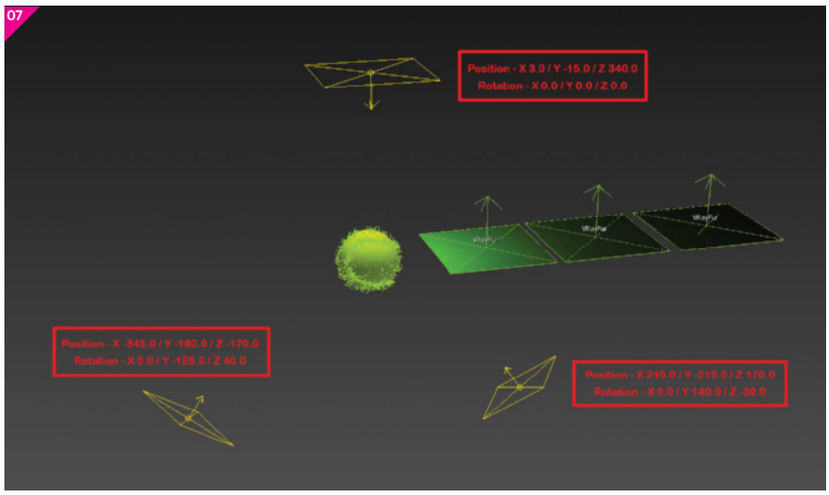
02 Select polygons You must have seen tennis balls before, so you would know that tennis balls have two colours: a green surface and a thick white line. Only the green part has fur, the white line doesn't have fur. So what you have to do is to go to Edit Poly>Polygons and select the green part of the tennis ball as shown in the image. VRayFur will then generate hairs only on the selected part, and not on the white line.

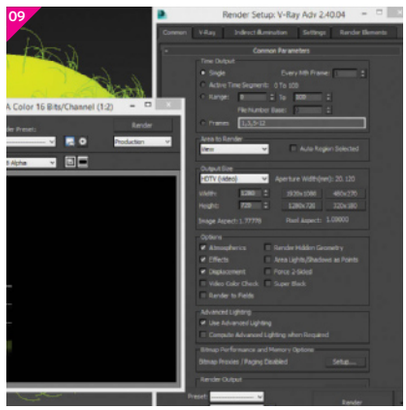
03 Add the first VRayFur The first VRayFur we will work on is for shorter-sized hairs with a large hair count, like base hairs. So after finishing the polygon selection, just assign the VRayFur by going to Standard Primitives>Geometry>V-Ray>VRayFur. Every parameter is simple to understand, but remember that if you want to increase the count then you can just go to Distribution Section and increase the Per Area count or Per Face count. You can set other parameters if you wish.

04 Add the second VRayFur The second VRayFur that we will work on is for the medium-sized hairs with a medium hair count. These hairs are thick, quite long and very messy. They will cover up the smaller fur or hairs, so just play around with the Count, Thickness and Bend parameters. You can then set the parameters as per your requirement or you can refer to our image for Step 5.

05 Add the third VRayFur The third VRayFur is for longer-sized hairs with a smaller hair count. These hairs are thin, very long, too curly and messy. So to create these kinds of hairs, just play with the Count, Thickness, Bend and Variation. You can set the parameters as per your requirement or you can refer to the screenshot for this step.

06 Assign material to VRayFur You can choose the colour or material for Hair or Fur, so just go to Material Editor and select V-Ray material, choose the green colour and assign it to all three VRayFurs. You can set the Specular level, Glossiness, Reflection or Transparency as per your requirement. Yes it will increase the time of rendering, but you will get better output.


07
Position - X 3.0 / Y -15.0 / Z 340.0
Rotation - X 0.0 / Y 0.0 / Z 0.0
Position - X -345.0 / Y -180.0 / Z -170.0
Rotation - X 0.0 / Y -125.0 / Z 46.0
Position - X 210.0 / Y -215.0 / Z 170.0
Rotation - X 0.0 / Y 140.0 / Z -30.0



07 Add light We will need to add light in the scene, so we will use three VRayLights in three different angles. You can set the light setting and rendering settings as per your requirement or knowledge, or you can set the light's position as we have shown in the image on the left.

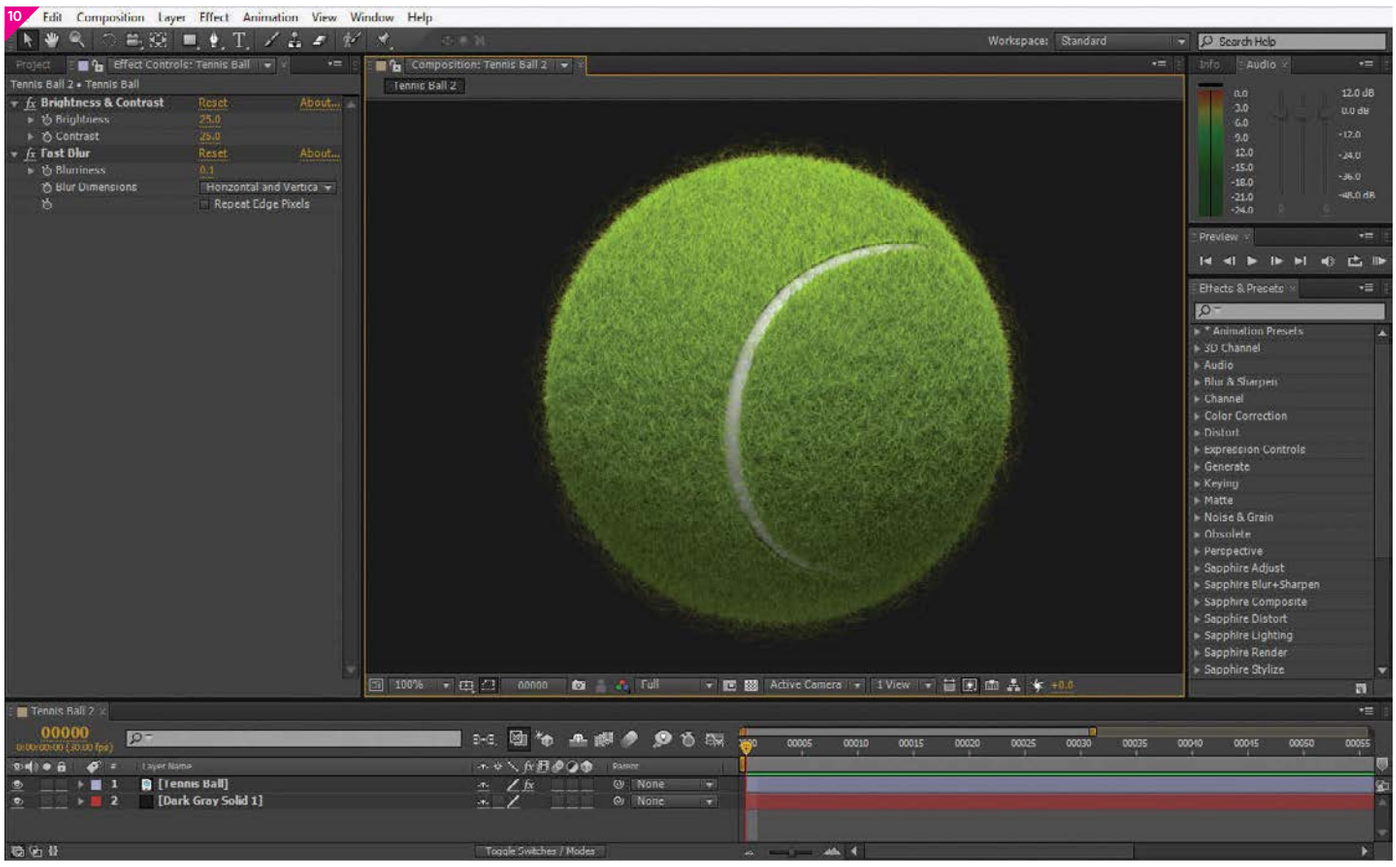
08 Light parameters Now set the Light Parameters. Select the first VRayLight and then set the Multiplier as 12, Size as 95 x 80 and set the Sampling Subdivs as 32. Now select the second VRayLight and set the Multiplier as 5, Size as 62x60 and the Sampling Subdivs as 32. Now make the same changes in the third VRayLight.

09 Render As you know we are going to render this scene in V-Ray, so make sure you don't turn on Indirect Illumination, as it will increase the render time. If you think that it's really necessary and you have good knowledge of rendering with a good machine, then turn it on if you really want to.

10 Post-process with After Effects or Photoshop After finishing up with rendering, import the sequence into After Effects or Photoshop and assign some effects as per your requirements. Then export this image sequence into video format and voila!

Lighting and rendering

We have used three lights in this tutorial, but you can use more lights or a single light for the output. You can use global illumination for more realistic output, but remember it will increase the render time.



All tutorial files can be downloaded from: **filesilo.co.uk/3dartist**

Technique focus

Incredible 3D artists take us behind their artwork

SCULPTING I started by gathering references of écorché busts, and I tried to match them proportionally. I then modelled a portrait to sculpt a rough bust using Blender's Dynamic Topology, so I could quickly get forms and proportions without worrying about topology. Then I retopologised, followed by detailed sculpting of the wrinkles and pores on the new mesh.

Mattias Lind
mattiaslind.com

A student at Luleå University of Technology, Sweden, Mattias started using 3D software at the age of 12

Software Blender

Berserker, 2015

WANT MORE?

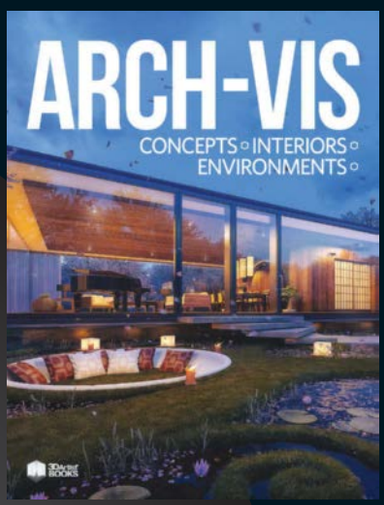
Go to **GreatDigitalMags.com** and get great deals on brilliant back issues & exclusive special editions

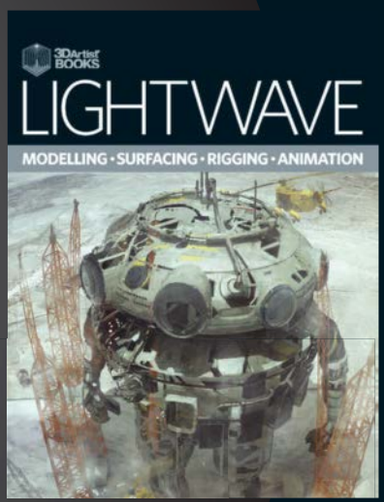
INSTANT ACCESS TO BACK ISSUES

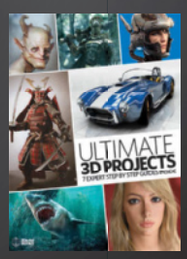
PLUS SAVE EVEN MORE IF YOU SUBSCRIBE

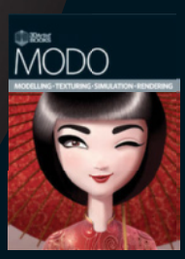
EXCLUSIVE
BOOKS & SPECIAL EDITIONS

★ GO TO GREATDIGITALMAGS.COM NOW ★









ALL AVAILABLE TODAY ON
GREATDIGITALMAGS.COM

BLENDER

Plane tracking and compositing in Blender

Everyone knows Blender as the free, open source 3D program. What many people don't know is that it's also a great 2D program. Tracking, rotoscoping, node compositing – Blender has it all. In this tutorial, we're going to put Blender through its paces, but we're not going to touch a 3D viewport at all.

Unlike other compositing programs, Blender uses two different workspaces for doing 2D tasks: the Node Editor and the Movie Clip Editor (MCE). The Node Editor is a typical node-based compositor, but for tasks that require frame caching (tracking, plane tracking, and rotoscoping), we'll use the MCE. Both work together perfectly.

Another thing Blender can do that many people aren't aware of is plane tracking. The plane is created from a selection of point tracks, but the plane motion is actually derived from calculations of how that plane moves through space. The more tracks you include, the more accurate the plane track. We're also going to touch on rotoscoping. Blender's rotoscoping tools have become favoured tools for many artists. It's clean and fast, and once you're familiar with some of the common keyboard shortcuts, it only gets easier.

This tutorial project is something VFX artists have to deal with all the time: putting a screen image into a tablet (or phone, TV, or any kind of screen). We'll do some 2D tracking, create the plane track, do the rotoscoping work, and then put it all together in the compositor.

While rotoscoping on this project, something to keep in mind is that we only need to roto the hand while it's over the plane-tracked area. When the mask we're working on is no longer overlapping the screen, we can simply move the mask out of frame and let it stay there.

YOUR FREE DOWNLOADS
from **filesilo.co.uk/3dartist**
- Tutorial screenshots
- iPad screens
- Video tutorial

01 Track all the markers Switch the Scene Layout from Default to Motion Tracking, then click on Open under the viewer to load your footage. You can use the middle mouse wheel to zoom and pan the image. In the Tools panel, click on Set Scene Frames and Prefetch. Begin placing tracking markers by Cmd/Ctrl+left-clicking on the markers. You can adjust the marker placement using the zoom window on the Properties panel. Select all the markers by pressing A twice, then track forward by using the tools on the left. We tracked all of them except the one covered by the hand on frame 42.

02 Create the plane track In the tools panel on the left, go to the Solve tab. Make sure you're on the first frame, select all tracks, and in the Plane Track section, click Create Plane Track. A plane will appear around all the tracks. The lower left corner is marked red and green, so we have to position it properly with how the tablet in the footage is rotated. Be sure to position and adjust the placement of the plane only on the first frame. Scroll through the timeline to check its movement.

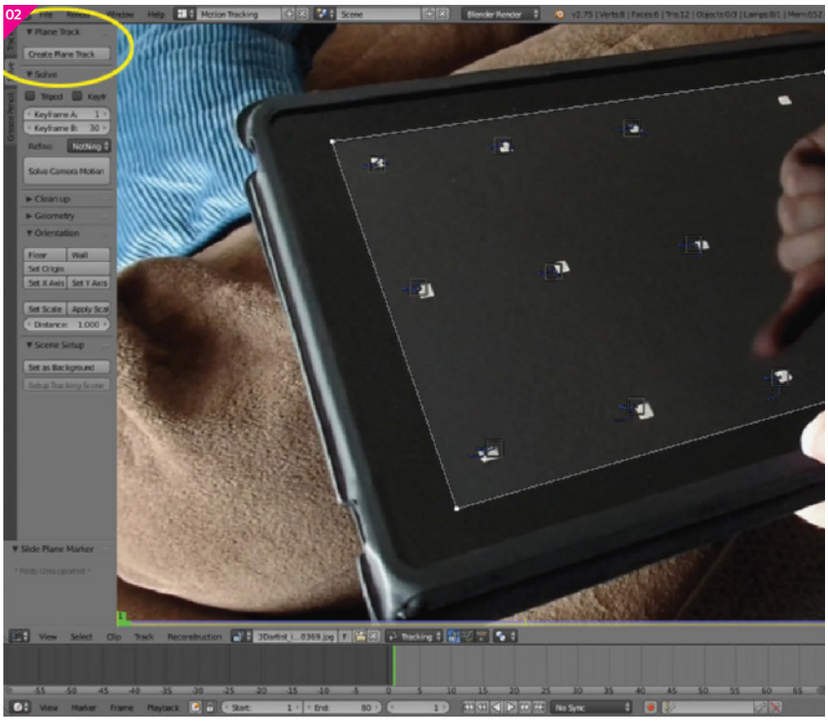
03 Begin rotoscoping Next we'll start rotoscoping. Press Tab to switch from tracking to masking. Click the New button under the viewer and rename the mask "finger". Start on frame 14, where the finger is touching the screen. Draw the mask by holding Cmd/Ctrl+C and clicking and dragging in the viewport. Continue drawing mask points around the finger where it overlaps the plane track, and to close the mask, press Alt+C. Change handle types by pressing V, and if the handles are pointing towards the inside of the closed mask, switch the mask's direction using the button on the tool panel.

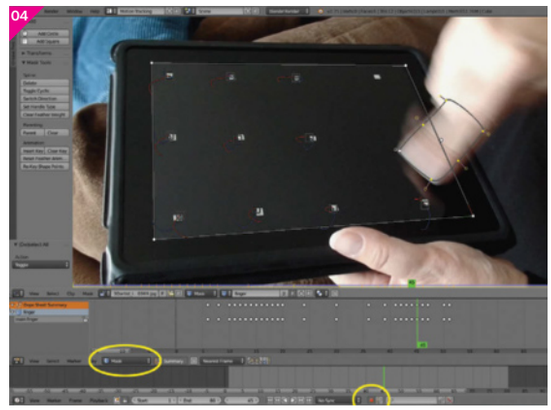
04 Keyframing and using the Dope Sheet Once the handles are adjusted, set a keyframe by selecting all the points and pressing I. From this point on, we'd like keyframes to be inserted automatically, so activate the Automatic Keyframe button (the little red dot under the timeline). Then start adjusting the roto on other frames. You can lock masks by going to the Mask Layers panel in the Properties on the right and deselecting the little arrow next to the mask. You can also name each mask by double-clicking the name and typing a new one. You can also create a new UI panel, set it to Dope Sheet, and choose Mask from the Mode options.

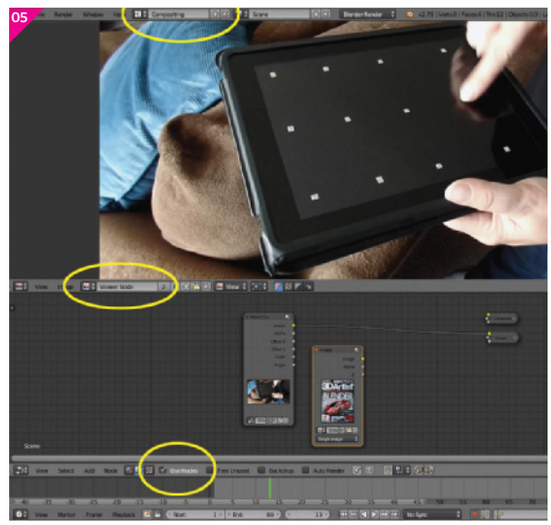
05 Moving to the Compositor Once rotoscoping is completed, we're ready to switch to the compositor. Switch the Scene Layout to Compositing. We prefer the viewports to be arranged like other compositing programs. Under the node graph window, activate Use Nodes and delete the default Render Layers node. Use Shift+A to bring in a Movie Clip node and choose the footage we're using from the drop down menu. Cmd/Ctrl+Shift+left-click on the node to create a Viewer node, and choose Viewer in the menu under the UV/Image Editor window so you can see the composite. Use Shift+A again to bring in an Image node, and choose the tablet screen footage we've provided.

Remove the tracking markers

To remove the tracking markers I created a completely separate project and brought in the same footage. I tracked each marker and created a plane track. I drew small circular masks around each marker and parented them to the plane track with Cmd/Ctrl+P. In the compositor, I used this mask to cut a hole in the alpha channel of the footage, then used the Inpaint node to fill in the holes by pulling the edge pixels inwards. I rendered this project as a fileset for use in the main project. You can download a video to watch the process of removing the tracking markers.







06 Layering in the screen image Change the image node from Single Image to Image Sequence and set the frames to 80. Use Shift+A to place a Color>Alpha Over node directly after the Movie Clip node. Plug our screen image into the bottom socket. Between the screen image node and the Alpha Over node, add in a Distort>Plane Track Deform node, and choose the tracked footage, the Camera, and the Plane Track to fill in all of the node options. The image should now be tracked to the screen perfectly! Now we have to put the finger back over the image on the screen.

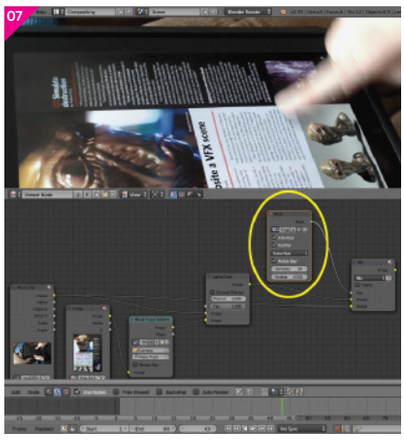
07 Bringing in the rotoscoping Use Shift+A yet again and create an Input>Mask node. In the drop-down menu, choose the finger mask option and turn on Anti-Alias. After the Alpha Over node, add a Color>Mix node, and plug our original Movie Clip footage into the bottom socket. Into the Factor socket, plug the Mask node. For the mask to be rendered correctly, be sure that you have turned up the Resolution in the Dimensions panel, on the far right of the window, to 100 per cent. The finger should now be layered correctly over the tablet. Turn on Motion Blur on the mask node and turn the samples up to 24.

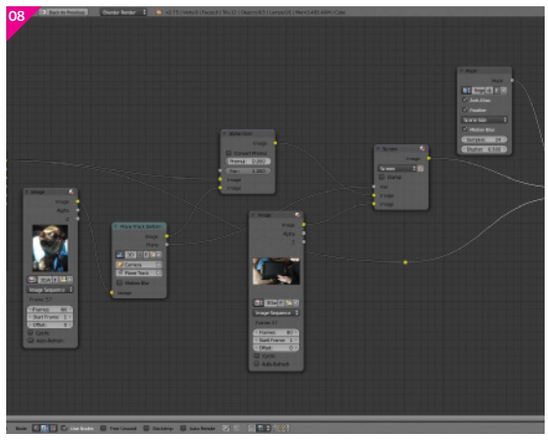
08 Add the reflection Bring in another Image node and load up the frame sequence. With the tracking markers removed, set Frames to 80 again. Create another Mix node between the Alpha Over and the first Mix node. Plug the markerless footage into the bottom socket of this Mix node and set the blending mode to screen. Now plug the Plane socket from the Plane Track Deform node into the Factor socket of this Screen Mix node. Most of the work is now done! Now you can go back and begin adjusting things to your liking and dialling in the details.

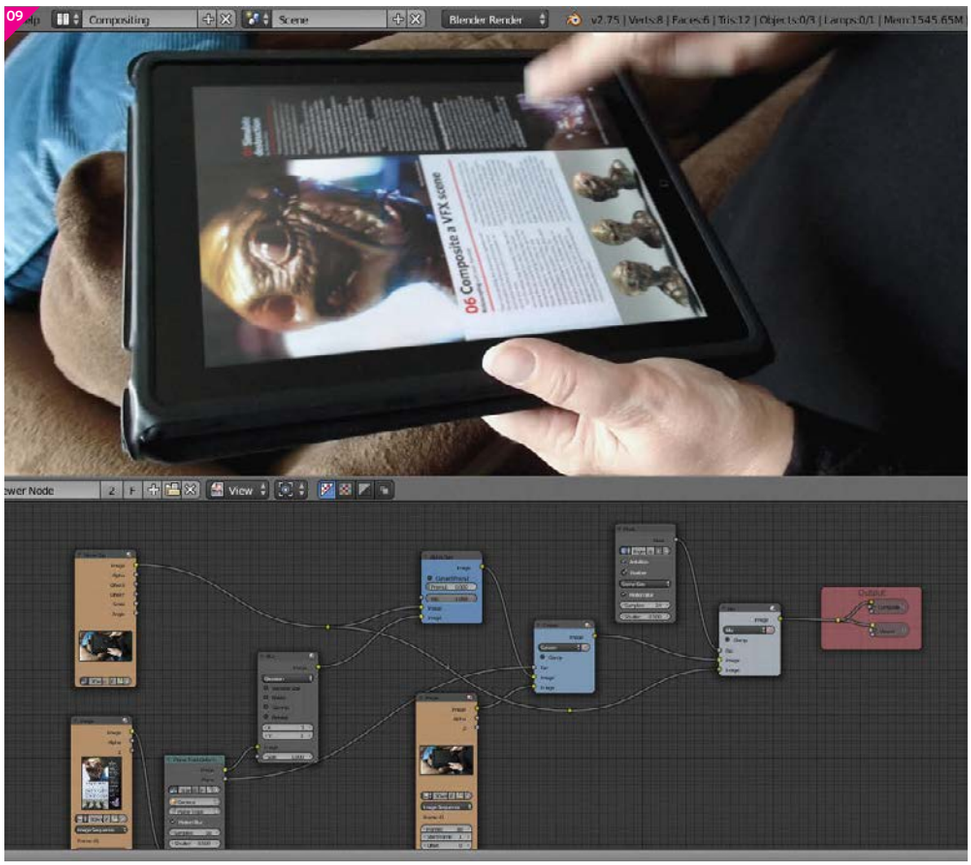
09 Final touches To finish up, turn on Motion Blur on the Plane Track Deform node. Maybe add a Blur after the Plane Track Image at a low value to help blend it into the footage. If you find that the plane track isn't quite lined up to the screen edges perfectly, go back to the Motion Tracking scene layout and tweak the position of the plane track to suit (but be sure you're on frame 1!). Make sure that you connect the last node in your node tree to the Composite node, or else none of the node tree will be calculated at render time. You could also organise the node tree with frames, reroute nodes, and custom colours.

Mask edge feathering

If you want complete control over the motion blur on the roto, use edge feathering. To use it for the whole mask, simply hold down Shift while you click and drag from one of the mask points. The green spline that appears represents the falloff. To set it per point, select that point, press Alt+S and drag away from the point. With both of these techniques, if you have lots of keyframes on the mask, you'll have to use the Reset Feather Animation button in the Tools panel. It will reset the feather animation so it is consistent with the frame you are currently on.







All tutorial files can be downloaded from: **filesilo.co.uk/3dartist**

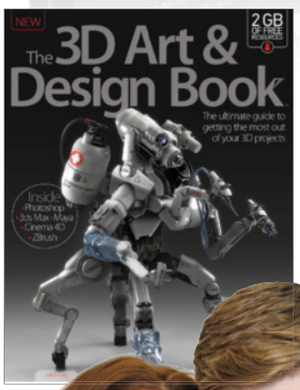
From the makers of 3DArtist

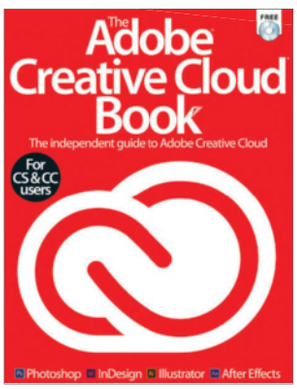
NEW
FREE 23GB OF DIGITAL ASSETS
The 3D Art & Design ANNUAL
Take your 3D projects to the next level & transform the way you work

The 3D Art & Design ANNUAL

The 3D Art & Design Annual is a collection of the best content from 3D Artist. Grasp all of the latest software, get your head around rigging and animation, add textures, create visual and lighting effects and get modelling your own 3D projects!

Also available...





A world of content at your fingertips

Whether you love gaming, history, animals, photography, Photoshop, sci-fi or anything in between, every magazine and bookazine from Imagine Publishing is packed with expert advice and fascinating facts.

BUY YOUR COPY TODAY

Print edition available at www.imagineshop.co.uk

Digital edition available at www.greatdigitalmags.com

Print Tablet Phone Desktop

Houdini 15

The latest release from Side Effects trumps the last, with advanced material capabilities and improved modelling

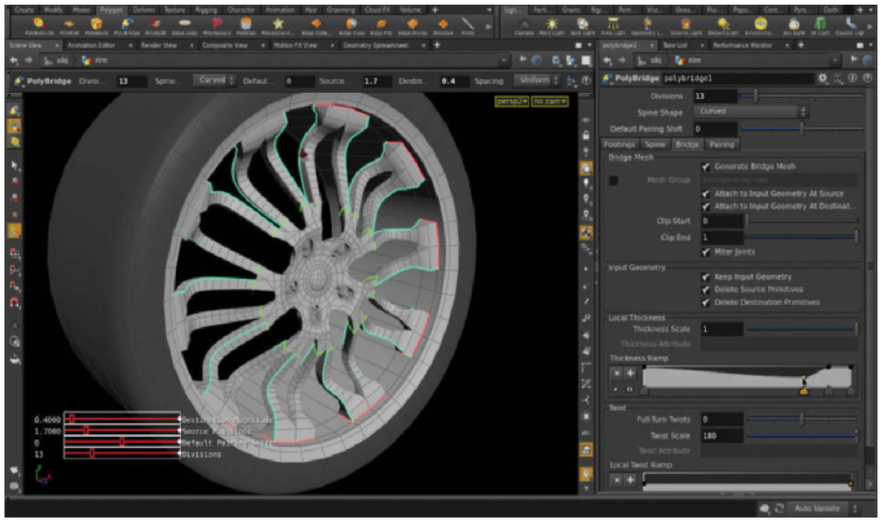
Houdini FX is a top-notch application when it comes to high-end visual effects. In the latest release (version 15), it was given more tools which makes the work easier. In the past, Houdini was more or less the main application for the more technical-minded, but with the latest shading capabilities even artists can achieve stunning results without huge shader networks within the VOP base of a Mantra Shader Builder node. To test the new shading features a spaceship, which is actually a simple asset, was used. The asset was prepared as an alembic file, including information about UVs and primitive attributes to separate some bits for the material assignment.

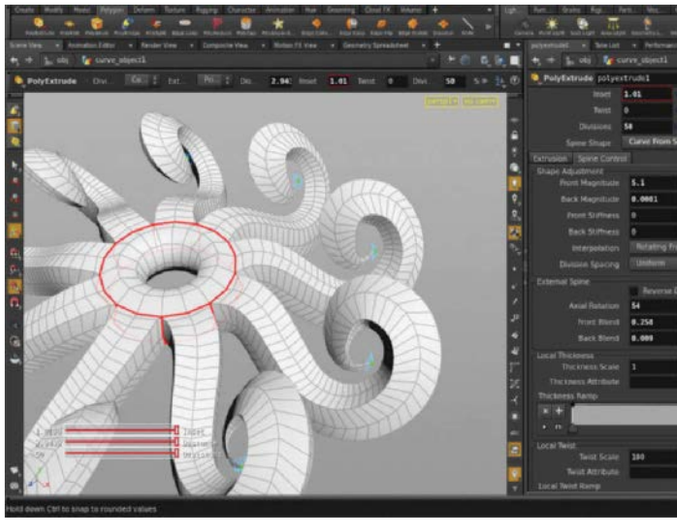
The work was started by creating a Material Shader Builder, where you can build shader networks on a VOP level. Instead of using the old way of creating PBR materials from scratch with the corresponding PBR nodes, we can now directly create the Principled Shader node, which was made by Disney and gives us all of the basic PBR functionalities on the fly. Before we dig deeper into the whole setup we want to point out that the new Principled Shader was used as well as the Layer Mix node, Set Layer Component node and the Dirt Mask node. All of them in combination are great for enabling easy material layering. The Principled Shader node has some additions and we first added a Texture node to give the base colour a better tint. A Color parameter – connected with an Add node to the Texture node – gives the texture a coloured touch. To make it tileable, a UV Coords node was next. The u and v coordinates were separated with a Vector to Float node.

For the next step, we duplicated the Principled Shader base and changed the colour to a worn-out rusty dark tone to look like corrosion. Then we made use of some more new nodes. Instead of painting a dirt texture we wanted to use an advanced technique. So we looked at the Layer Mix node where input a is the output from the base principle shader and input b comes from the rust output. Next, we created the new Dirt Mask node which works with ambient occlusion. We used this node as the dirt mask to blend both PBR shaders through the Layer Mix node. We inverted the Dirt Mask node output with an Invert node. To give the procedural dirt mask more detail we added a Unified Noise node, which drives the bias direction. We then created the next new node called Set Layer Component. The input of this is the layer output of the Layer Mix node. Layer Component enables the adding of a displacement texture to the current layer. The displacement setup is the same structure as the base Principled Shader with the tiling, but the inputs are N for normals and P for points to work properly. Finally, Set Layer Component was plugged into a Compute Lighting node, which makes the material visible even if the rendering engine is not a recommended PBR. The Compute Lighting node outputs go into the Surface Output node of their corresponding slot.

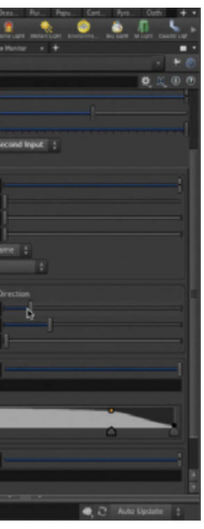
The new nodes, especially the Principled Shader, helped to significantly improve production time. In the past many of these functions had to be prepared manually by setting up each node. The Dirt Mask nodes let us quickly create ID masks procedurally for separate regions without painting bitmap textures. We can create weathering effects by adding procedural noise nodes. The new layering possibilities gave us the flexibility to concentrate on simple shaders and push them to maximum visual quality; it gave us the ability to mix them instead of creating one confusing shader network.

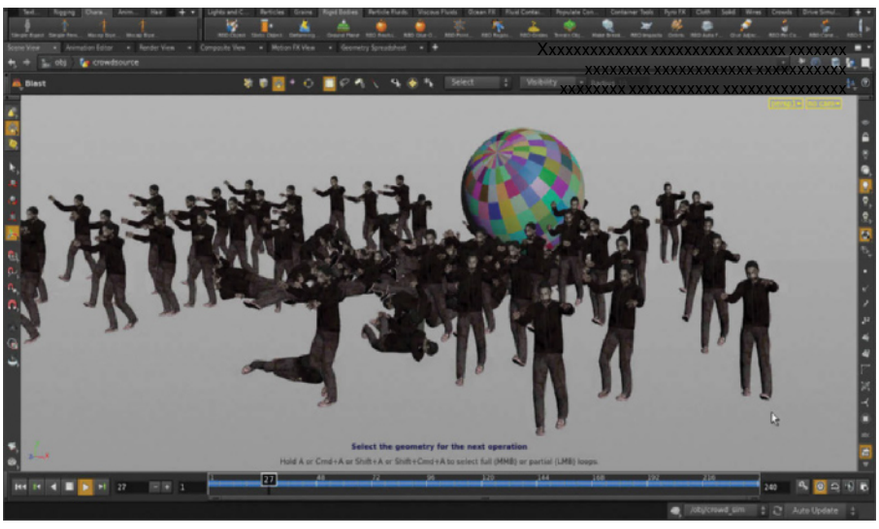
Rainer Duda





> “The new nodes, especially the Principled Shader, helped to significantly improve production time”





MAIN The setup of PBR layered materials within Houdini was never as simple as it is now with the newly added PBR Principled Shader from Disney

BOTTOM LEFT Instead of adding faces manually, users are now able to simply bridge polys with various parameters to change the look

BOTTOM MIDDLE The new Poly Extrude functionality with curve input makes it easy to create interesting shapes

BOTTOM RIGHT Users can now smack crowds with RBD objects and by using the Bullet solver

BELOW A newly implemented Lava viscous fluid tool, as well as Melt Object tool, can be found in the viscous shelf

Essential info

Price	$4,495 ($199 per year for Houdini Indie)
Website	sidefx.com
OS	Windows 7 SP1 up to 10 (32-bit and 64-bit) / Mac OS X 10.10.2 and up
RAM	8 GB RAM minimum, 64 GB needed for fluid simulations
Disc space	1GB
GPU	OpenGL 3.3 support minimum
GPU RAM	4GB minumum

Summary

★★★★★ **Features**
★★★★☆ **Performance**
★★★☆☆ **Design**
★★★★☆ **Value for money**

Verdict ★★★★☆

Houdini FX 15 has truly become a more powerful tool and it has helped to bridge the gap between artists and technical directors

MARI 3.0

MARI 3.0, with its new modules and enhanced flexibility, will allow artists to work more efficiently

MARI has established itself as the leading software for texture and look-development artists in the entertainment industry. With this latest release, the developers at The Foundry have crafted some impressive new features that will allow MARI users to have an even more flexible and non-destructive workflow.

The core structure of the paint software remains the same, but version 3.0 is enriched by new modules and functions that will help texture artists to interact with objects, channels and layers in a more efficient way.

The biggest and most useful new feature is the introduction of a Node Graph. MARI has worked with nodes under the hood from version 2, but this function has now been made directly available to users, making the sharing process between layers and channels easier.

You can interact with nodes in two different ways. The first is to work with channels and layers like in version 2 but to occasionally create a Graph Layer within any layer stack. This layer is a self-contained Node Graph group with an input that sources the information from the previous layers, and an output. These graph layers are helpful for automating processes and creating small scripts that can then be reused multiple times.

The second way is to work entirely with nodes. This has to be activated under preferences/Node Graph/Advanced View and gives users full access to the node graph. In the advanced view, the Node Graph shows everything that has been created with MARI (channels, layers, shaders) so you can ideally create all of your textures through it.

MARI will still try to copy whatever you do in the Node Graph in the channels and layers palettes (and vice versa), giving artists even more freedom to jump back and forth between the two modes during their work.

An issue from previous MARI releases is that the software was completely lacking solutions for UV-based map bakes. This has now been improved by integrating the MODO rendering technology (with no need to buy a MODO licence). Through the new MODO Render Palette, users can now bake high resolution maps using presets (such as curvature, occlusion and so on). The baked maps can be checked and tweaked in the preview section before hitting bake, and they are automatically saved in a new channel after the process.

The MODO Palette can also be used to test-render any channel in the scene, allowing you to check your work without leaving MARI. Viewport texture preview is enhanced by the integration of Arnold, V-Ray, Unreal and Redshift Shaders.

The Foundry has further improved how you can preview and work with objects by introducing a basic hierarchy structure, with the ability to create child objects and locators. The hierarchy is fully supported when importing the newly supported FBX format.

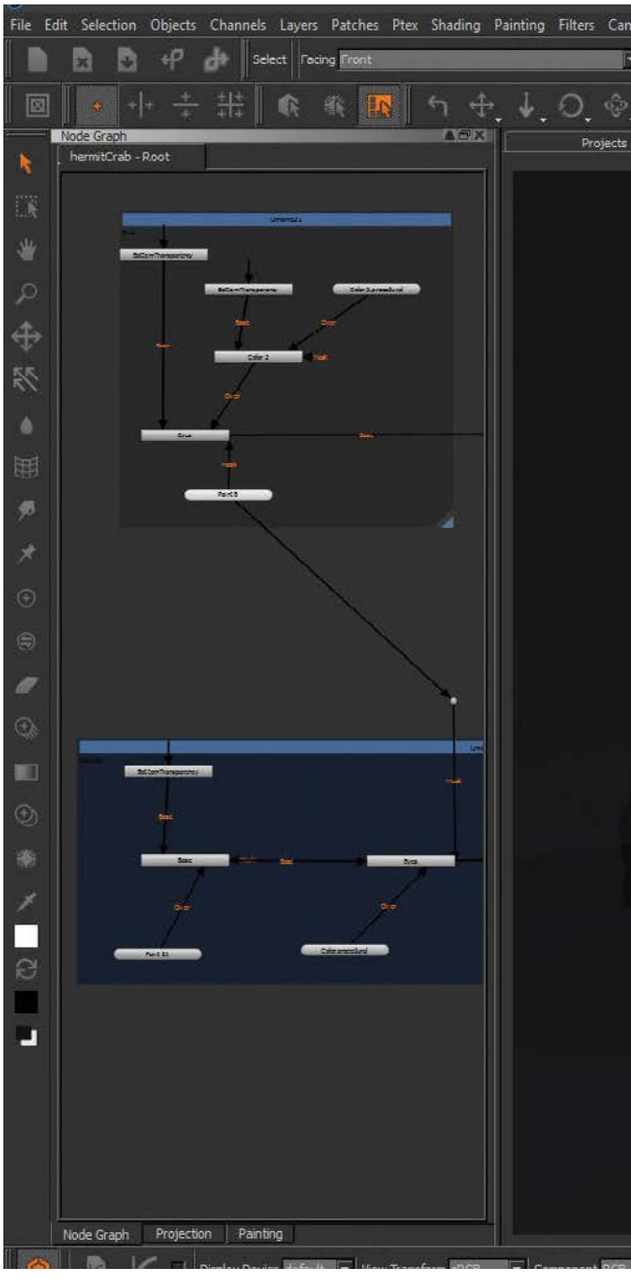
Objects can also be moved, scaled and rotated more accurately with the transform tool, which now displays a manipulator instead of just allowing you to pan objects along the camera view.

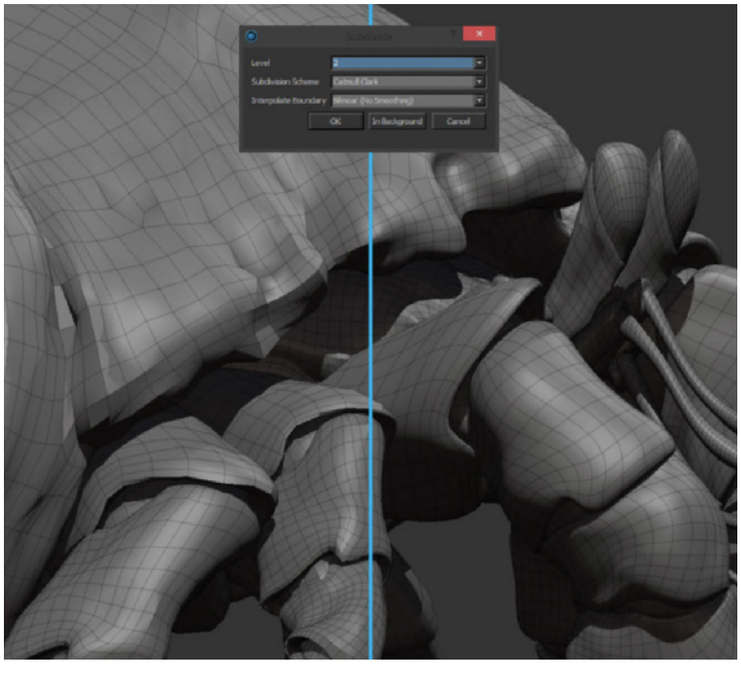
Selecting components has also been made simpler: quads can now be selected on meshes, as they don't get triangulated on import anymore. Artists can also create their custom selection groups and interactively select them using the new smart select option 'selection group'.

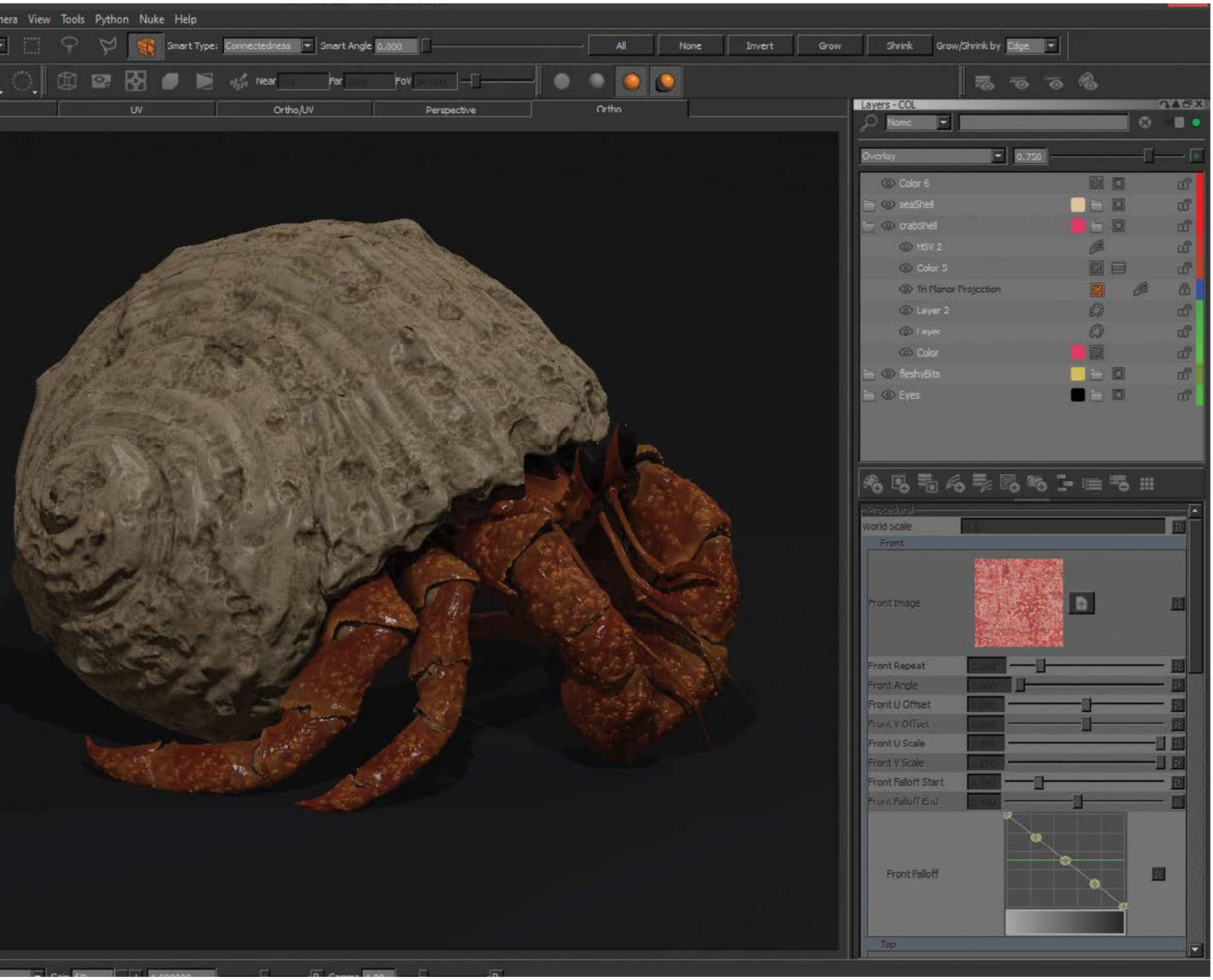
Last but not least, sharing information between MARI files has been significantly enhanced by the introduction of script sessions. Until now, users could only save archives containing everything (objects, textures, source images, etc). Now they can decide what to export/import from their scene, allowing, for example, to share only a particular channel with their colleagues. Node Graph Gizmos can also be exported from MARI, making them easy to share and reuse in multiple projects.

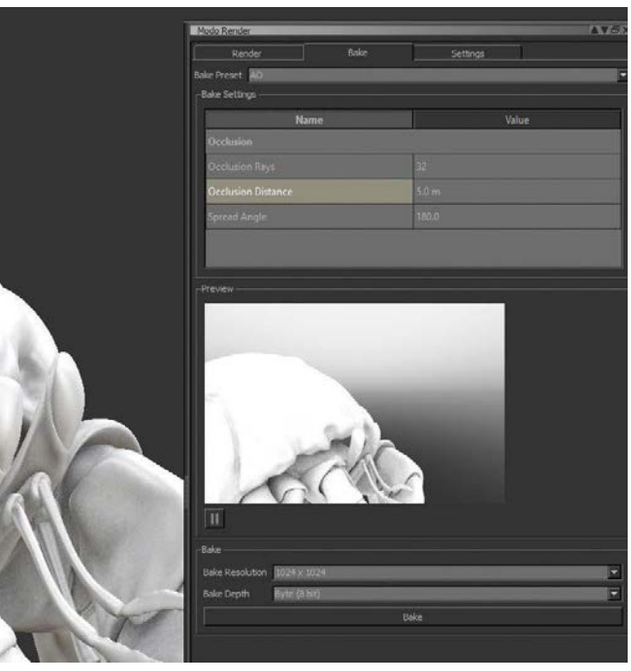
With this new release The Foundry has enhanced its already excellent software package by making it easier to share work with others and to create complex texture networks. The introduction of baking presets and nodes will also encourage and enhance procedural detail creation, making work easier for both videogames and visual effects artists alike.

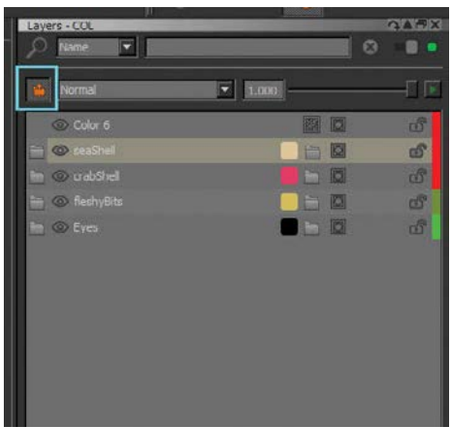
Daniele Orsetti











MAIN Following its initial development at Weta, MARI has quickly become the leading texture painter

FAR LEFT OpenSubdivision is now supported, so artists can paint directly on a subdivided version of their model

LEFT Baking multi tile and UV-based high-resolution occlusion maps is extremely easy with the new MODO renderer

ABOVE A small but welcome feature: Groups in Layer Stacks now allow Pass Through Mode, to mimic Photoshop

Essential info

Price	£1,465.20 inc VAT, £1,221 ex VAT
Website	thefoundry.co.uk/products/mari/
OS	64-bit Windows 7 and up / Linux / Mac OS X 10.9.5 and up
RAM	4GB minimum
Disk space	10GB disk space minimum for caching
GPU	NVIDIA/AMD card with latest drivers
VRAM	1GB minimum
OpenGL	Version 3.2 and up

Summary

★★★★☆ **Features**
★★★★☆ **Performance**
★★★★☆ **Design**
★★★★★ **Value for money**

Verdict ★★★★☆

A big step forward in workflow flexibility from previous releases

SAVE UP TO 50%

ON A GIFT SUBSCRIPTION THIS CHRISTMAS*

WIN £10,000 WORTH OF SOFTWARE
MODO • HOUDINI • V-RAY AND MORE
Practical inspiration for the community
www.3DArtistonline.com
85
3DArtist
SCI-FI
FROM CONCEPT TO RENDER
Discover new species and new worlds over 39 pages of incredible tuition
BUILD A MECH WOLF
Develop unique futuristic machines
3DS MAX COMIC BOOKS
Stylise your vehicle designs in only 13 steps
ACHIEVE HEROIC RENDERS PAGE 70
JUST £29.99
25 KEYSHOT TIPS & TRICKS
Experts teach you how to get the best out of the renderer
3D printing Destiny
Model and print your own game assets
Cyberpunk characters
Learn to use ZBrush to develop your ideas
10 ISSUES, SAVE 50%

GADGET
Packed with the latest, coolest and most exciting tech
12 issues, save 50%

HOW IT WORKS
The action-packed science and technology magazine
13 issues, save 46%

ALL ABOUT HISTORY
Bringing history to life for the whole family
13 issues, save 49%

HISTORY OF WAR
The stories, strategies, heroes and machines of historic conflicts
12 issues, save 50%

DIGITAL PHOTOGRAPHER
Inspiration, tutorials and tools for enthusiasts and professionals
12 issues, save 50%

RETRO GAMER
The number one magazine for classic gaming
12 issues, save 50%

ALL ABOUT SPACE
Discover the wonders of the solar system and beyond
13 issues, save 49%

SCIFINOW
The number one magazine for sci-fi, fantasy and horror fans
12 issues, save 50%

ORDER HOTLINE 0844 856 0644**
ONLINE AT www.imaginesubs.co.uk/xmas151

SUBSCRIBE TO ANY MAGAZINE FOR JUST £29.99

- Exclusive **Christmas offer**
- Save **up to 50%** on the shop price*
- Never miss an issue of your **favourite magazine**
- **Free delivery**, direct to your door
- **Ideal Christmas gift** - that lasts all year!
- **Free e-card** to send when you buy as a gift

BUY AS A GIFT OR TREAT YOURSELF!

Use code XMAS151 for this extra-special price.

Order by 2nd December to start your subscription the first issue after Christmas.

** Calls will cost 7p per minute plus your telephone company's access charge.

BY POST

Send your completed form to:
Imagine Subscriptions, 800 Guillat Avenue, Kent Science Park, Sittingbourne, Kent ME9 8GU

YOUR DETAILS

Title_____First name_____
Surname_____
Address_____
_____
_____
Postcode_____Country_____
Telephone number_____
Mobile number_____
Email address_____
This subscription is ☐ for me ☐ a gift

DELIVERY DETAILS (IF DIFFERENT FROM ABOVE)

Title_____First name_____
Surname_____
Address_____
_____
_____
Postcode_____Country_____
Telephone number_____

PAYMENT DETAILS

UK £29.99 Magazine name_____

FOR MULTIPLE ORDERS PLEASE CALL THE ORDER HOTLINE **0844 856 0644****

CHEQUE

☐ I enclose a cheque for £_____
(made payable to Imagine Publishing Ltd)

CREDIT/DEBIT CARD

☐ Visa ☐ Mastercard ☐ Amex ☐ Maestro

Card number ☐☐ ☐☐ ☐☐ ☐☐ ☐☐ ☐☐ ☐☐ ☐☐

Expiry date ☐☐ ☐☐

Issue number (Maestro) ☐☐

Signed _____

Date _____

All subscribers receive a monthly e-newsletter of news and offers.

Please tick if you would prefer not to receive any promotional material from Imagine Publishing:

by post ☐ by telephone ☐ by email ☐

Please tick if you would prefer not to receive any promotional material from other companies

by post ☐ by telephone ☐ by email ☐

Please tick if you DO wish to receive such information by email ☐

TERMS & CONDITIONS

* Titles are priced at £29.99 saving up to 50% on the shop price. For the full list of titles and issue details please visit **www.imaginesubs.co.uk/XMAS151.** This is a UK-only offer, for overseas offers please visit **www.imaginesubs.co.uk/XMAS151** or call **+44 (0)1795 592 869.** Gift subscriptions ordered by 2nd December will begin with the first issue on sale January 2015 – orders after this date will start with the following issue. You have the option of sending a digital gift card so please include your email address in the form above. Non-gift subscriptions will start with the next available issue.
Offer ends 31st December 2015. Promo code XMAS151

DISCOVER THE LATEST AND GREATEST GADGETS AND EXPLORE THE TECH INSIDE

TRY 3 ISSUES FOR JUST £1!

BRAND NEW FROM THE MAKERS OF HOW IT WORKS

NEW
FROM THE MAKERS OF HOW IT WORKS
Under the hood of Apple's biggest tablet
iPAD PRO
Gadget
WHY YOU DON'T NEED A NEW TV
NEVER CLEAN AGAIN! Robot butlers tested
200
WIN £800
HIGH TECH TOYS
THE MUST-HAVES TO MAKE YOUR INNER CHILD SQUEAL
JIBO
IF PIXAR MADE A ROBOT
THE ONLY KITCHEN GADGET YOU'LL EVER NEED
HOW TO PUT UP A SHELF STRAIGHT
DRINK LIKE A PRO
BUILD AN ARCADE MACHINE
SUPERCHARGED SKIING TECH
CRAZY CART
EVERY NERF BLASTER
REAL-LIFE JET PACK
BIGGEST AND BEST RC CARS

Every issue packed with

The latest tech Everything from hoverboards, drones, wearables, sports tech, smart homes and more...

Buying advice New and cool kit and where to get it

Tech teardowns Under the skin of the latest gadgets

and more ...

CALL THE ORDER HOTLINE

0844 249 0270*

OR ORDER ONLINE

imaginesubs.co.uk/gadget

and enter code NEW15T

*Calls will cost 7p per minute plus your telephone company's access charge. Please use code NEW15T. This offer entitles new UK Direct Debit subscribers to receive their first 3 issues for £1. After these issues standard subscription charges will apply; currently £15 every 6 issues. New subscriptions will start with the next available issue. Details of the Direct Debit Guarantee available on request. This offer expires 31st December 2015.

The Hub

The inside guide to industry news, VFX studios, expert opinions and the 3D community

> Animatrik is a forward-thinking company, having worked on many high-calibre projects. It's exciting to know that they will be using our solutions to power future productions

Jon Landau, producer, COO and partner at Lightstorm Entertainment

088 Community news

The Rookies

We learn about the changing face of the CG Student Awards, as it prepares to be reborn as multi-discipline competition, The Rookies

090 Industry news

Animatrik

Discover how the mo-cap studio licensed Giant and broke a world record in the process. Plus, Autodesk shakes up Flame

092 Project Focus

Tippett Studio

Find out how the veteran studio has diversified its output to include this cinematic experience for a Chinese theme park

094 Social

Readers' Gallery

The latest images created by the **3dartistonline.com** community

To advertise in **The Hub** please contact Simon Hall on **01202 586415** or **simon.hall@imagine-publishing.co.uk**

The Rookies packs a punch with a range of new categories for 2016

The CG Student Awards rebrands

The CG Student Awards is now officially known as The Rookies and is expanding into new creative fields

THE ROOKIES

ABOVE The Rookies is an annual event showcasing and discovering the best new talent graduating from courses in creative fields

CG Student Awards has worked successfully over the last six years with many of the world's most respected studios to create a solid platform and helped to develop many opportunities for the world's finest students to kickstart their creative careers, network with studios, explore new technologies and connect with other passionate artists from around the globe. During this time, the CG Student Awards has established itself as the largest online awards platform for creative students, having awarded over $900,000 in prizes and 74 paid studio internships.

With a strong and respected legacy in visual effects, animation and next-gen gaming industries, this year the team has expanded the event to introduce nine additional prize divisions focusing on the most highly competitive artistic industries taught at higher educational facilities today. "I'm really excited about expanding into new creative fields. There is so much talent out there, and I strongly believe The Rookies is the greatest opportunity for students to showcase their skills and get their careers moving," said Alwyn Hunt, business development manager of The Rookies.

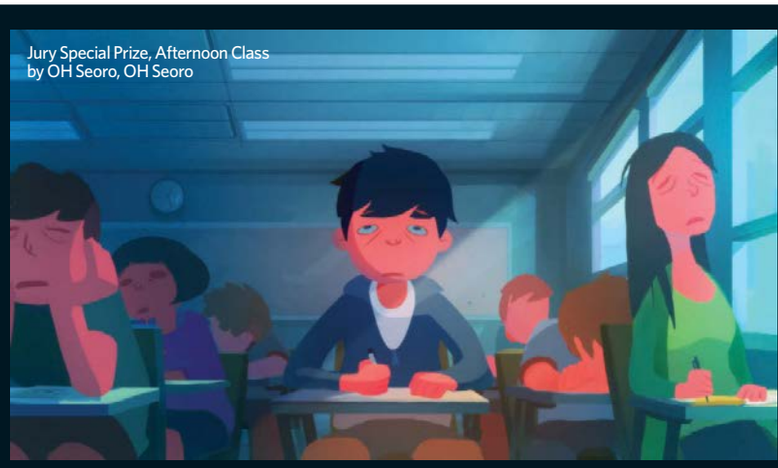
The categories for The 2016 Rookies are as follows: **Architecture & Visualisation**, including interior and exterior design, landscaping, and sustainability; **Fashion Design** for entries from students in textile and fashion departments from top institutions of higher education; **Game Design & Development**, video game-based content in the form of completed games for console or mobile devices, or supporting media; **Graphic Design** encompassing visual communication and problem-solving through the use of type, space, image and colour; **Illustration & Concept Art** created for film, games, scientific visualisation, narrative or architectural purposes; **Industrial Design** focused on product, furniture and gadget design that is to be manufactured through mass production. **Interior Design**, covering design of the decorative elements of the interior of a house, apartment, office, or other structural space; **Photography**, including images focusing on landscapes, street, portrait, advertising, sport, and editorial content; **Virtual Reality**, dedicated to the art of animation and visual effects with particular emphasis towards the digital realm. **Visual Effects & Animation**, as the world of Virtual Reality has exploded with enormous interest and opportunities for creative exploration; and finally, **Web & Application Design**, for content viewed through a browser of mobile device with a focus on interaction, user experience, and design.

> There is so much talent out there, and I strongly believe The Rookies is the greatest opportunity for students to showcase their skills and get their careers moving

Alwyn Hunt, business development manager of The Rookies

With the expansion into new fields, the team has also rebranded as The Rookies for a fresh design and vision. "The new name is a great step forward for us. Being a rookie in sports means you are in your first season of the big leagues. This rings true for us as our entrants have just graduated and are taking that first step into the professional world." said Andrew McDonald, COO of The Rookies.

In conjunction with the rebrand, The Rookies is launching an education directory in collaboration with leading schools around the world. The directory will allow prospective students to find and research the best schools and courses based on the results of the awards in previous years. "The focus has always been about showcasing the best student talent, but it's about time the educational facilities received the same recognition. The great difference with our directory is that schools will be ranked based on the performance of students as judged by our panel of industry experts each year," said Andrew McDonald. The Rookies will take place next from 7 March to 11 July 2016. To keep up to date with more information visit **www.therookies.co** or find it on Twitter via the handle @TheRookiesCO.



Jury Special Prize, Afternoon Class by OH Seoro, OH Seoro

SIGGRAPH Asia award winners

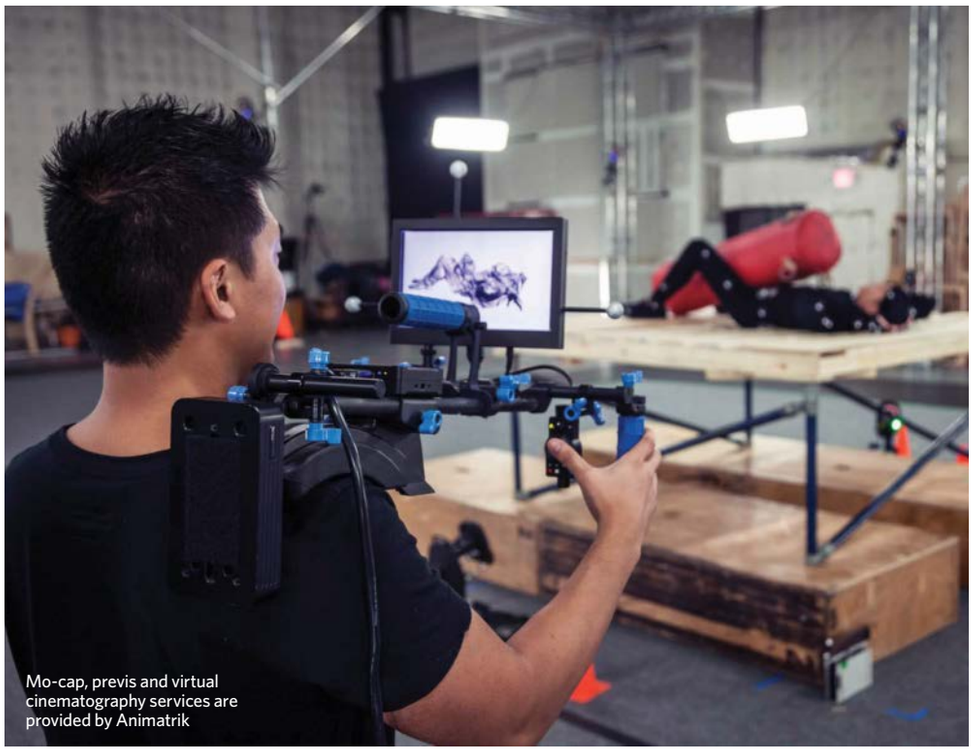
Discover this year's triumphant computer animators and their unique pieces

This year's computer animation festival award winners at SIGGRAPH Asia 2015 have been announced. The Jury Special Prize was awarded to Afternoon Class by OH Seoro, OH Seoro (South Korea). In this unique and visually stunning piece, audiences are taken through the first-person perspective of someone in an afternoon class. We follow him as he sits during the afternoon lessons, as his head gets heavier and he tries harder to stay alert. The Best Student Project Prize went to Natural Attraction by Marc Zimmermann, Filmakademie Baden-Wuerttemberg (Germany). Natural Attraction showcases a natural spectacle which turns a sparse, dry landscape into a fruitful place bearing new life. The interplay between sky and Earth brings to mind a sensual love act to express the dependency and perfect correlation of both elements.

The Best in Show award went to Chase Me by Gilles-Alexandre Deschaud, Gilles-Alexandre Deschaud (France). Chase Me is a hybrid film exploring two worlds, stop-motion and CGI films. The project started out as a CG movie, which was then 3D printed frame-by-frame. Each second of the film is made up of 15 separate frames. Everything on the screen has been 3D printed, from the sets to the characters. Chase Me is made up of about 2,500 printed parts in total.

ABOVE Best Student Project Prize, Natural Attraction by Marc Zimmermann, Filmakademie Baden-Wuerttemberg

LEFT Best in Show Award, Chase Me by Gilles-Alexandre Deschaud, Gilles-Alexandre Deschaud



Mo-cap, previs and virtual cinematography services are provided by Animatrik

Animatrik licenses Giant technology

Games and film service provider embraces Giant and breaks a mocap world record

Animatrik Film Design Inc, headquartered in Vancouver, Canada, has officially licensed LEI/Giant technology from film production company Lightstorm Entertainment Inc, and broken a world record at the same time (see below).

"Incorporating Lightstorm Entertainment Inc's Giant technology into our pipeline is an exciting moment for us. It will contribute greatly to our mission of providing directors, supervisors, and producers the results that they require for success: flawless real time, an efficient turnaround and a deliverable that is faithful to the original performance. We look forward to continuing to work with Lightstorm in this pursuit of evolving the craft of performance capture" explains Brett Ineson, CEO of Animatrik.

The LEI/Giant technology offers a sophisticated suite of tools providing more accuracy, reliability and efficiency, which ultimately enables 3D animators to create high-quality, true-to-performance character animation. It has previously been used for *Avatar, The Lord Of The Rings* trilogy, *Iron Man* and *Rise Of The Planet Of The Apes*.

Jon Landau, producer/COO/partner at Lightstorm Entertainment added to this with the following comment: "We're pleased that Animatrik has become a select partner, licensing our LEI/Giant performance capture technology. Animatrik is a forward-thinking company, having worked on many high calibre projects. It's exciting to know that they will be using our solutions to power future productions."

New mo-cap World Record

When integrating and evaluating the LEI/Giant system into its pipeline, Animatrik captured 21 mo-cap actors in a real time capture volume, taking the limits of performance capture beyond what is considered to be the current world record. Footage of the session has been uploaded to Vimeo and can be seen here: **https://vimeo.com/143139270**

Autodesk introduces subscription options

New support for Flame on OSX and Flame Family 2016 Extension 2 in late November

Autodesk is now offering its well-known Flame software as a desktop subscription, with pricing starting at $750 USD per month or $500 USD per month on an annual setup. Flare and Flame Assist are available as standalone products as well, with monthly subscription prices starting from $400 USD.

"With the new Flame business model, it's never been easier for artists and studios to access the powerful tools they need for the high-end finishing that their customers demand," explains Marc Stevens, vice president of Film and TV at Autodesk.

It was also announced that Flame will be licensed on Apple Mac OSX for the first time later in November, with the recommended configuration specifications available soon. Early in 2016, sales of Flame as a turnkey system will discontinue.

Extension 2 highlights include DNxHR media support and updated R3D support, allowing Flame to directly support the new Dragon 6K sensor and Rec 2020 colour space. There are also further performance gains for colour grading workflows and improvements in the form of softness controls for preview and rendering operations.

Autodesk has implemented these changes to expand the Flame brand.

Flame Premium won't be available for Mac OSX, but Flame, Flame Assist and Flare will be

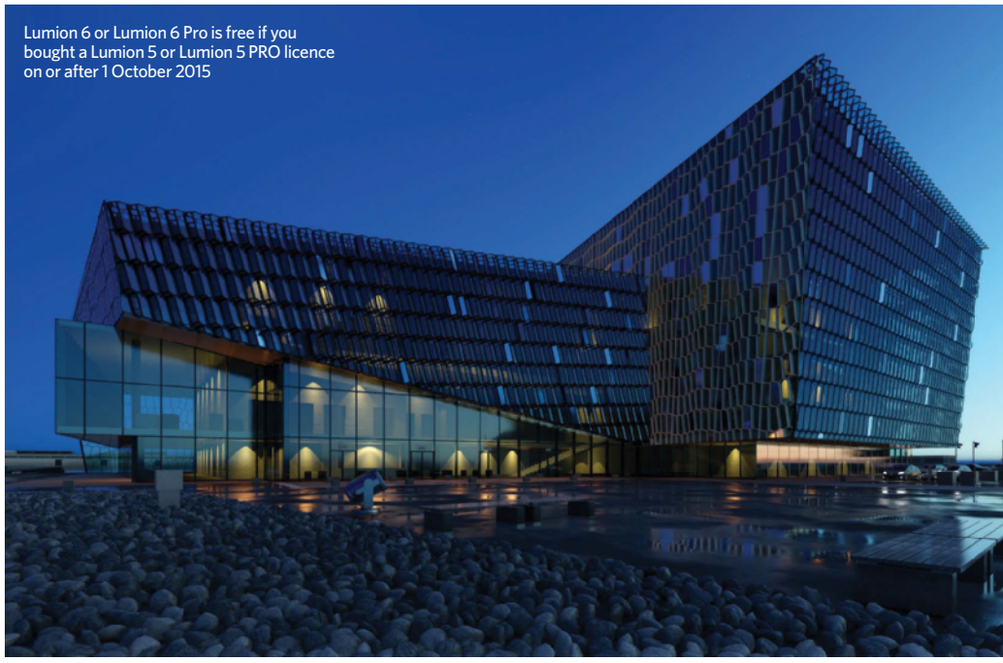
HAVE YOU HEARD? The Visual Effects Society announced it will honour Sir Ridley Scott with its Lifetime Achievement Award

Lumion 6 is out now

Lumion's render engine has been overhauled resulting in hundreds of new improvements

A host of new updates for more realistic and faster arch-vis renders have been added, including Pureglass for transparent, translucent and frosted glass; Speedway reflections for improved image quality, Hyperlight 2 for more accurate representation of light on surfaces and OmniShadow, which is designed to make objects look and feel more solid through better shadows. Some of the rendering improvements are only available for the Pro version.

There's also greater compatibly with 3D CAD software including intelligent importing which checks for and fixes the most common model errors, faster than before. You'll also find DWG import and FBX v 16 support, and improvements to the render engine itself for faster results.



Lumion 6 or Lumion 6 Pro is free if you bought a Lumion 5 or Lumion 5 PRO licence on or after 1 October 2015

Vizpark releases Omnitiles 1.0

The Omnitiles plug-in lets you design your own tileable patterns of any shape

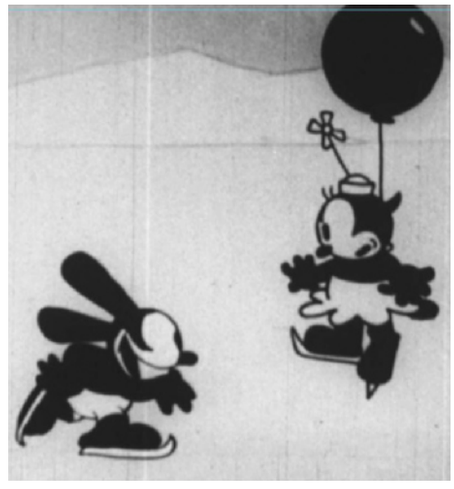
Omnitiles is a flexible plugin compatible with 3ds Max 2012 and above for producing V-Ray, Standard or Corona compatible maps and games textures. The Pattern Editor lets you draw seamless and tileable shapes and each can have its own map assigned. Snap-to-grid and display background image options help with pattern creation. The included Crossmap plugin produces randomised bitmaps or procedural maps. An included factory and growing online library of presets and materials is accessible via Material Manager Lite. Try the 14 day demo: **www.vizpark.com/shop/omnitiles-demo/**

Lost Disney film unearthed

'Sleigh Bells', starring Oswald the Lucky Rabbit, has been discovered in London's BFI national archive

Featuring the first ever character, Oswald the Lucky Rabbit, a print of 'Sleigh Bells' was preserved in the archive and re-discovered by a researcher browsing the online catalogue. The animation was created by Walt Disney and Ub Iwerks and will be screened by BFI Southbank in December – see image caption (right).

Andrew Millstein, president of Walt Disney Animation Studios, which oversaw the restoration, added, "We're thrilled to be collaborating with the BFI National Archives in the restoration of the 'lost' Oswald short, 'Sleigh Bells,' and to be sharing this delightful animated discovery with audiences in the UK as part of this special Disney holiday programme."



BFI Southbank is screening Disney Seasonal Shorts on December 12th, which includes the premiere of 'Sleigh Bells'. Tickets from **bfi.org/southbank**

Software shorts

Bringing you the lowdown on product updates and launches

FumeFX 4.0

FumeFX 4.0 for 3ds Max has been released and offers various new features that will help to run simulations faster. Highlights include a new QCG solver that can operate twice as fast as before, advanced vorticity, a new burning model, a built-in Blackbody Radiation Shader, smoke and fire sharpening at render time.

Substance Painter 1.6 free update

In the latest build, Substance Painter 1.6 gains performance boosts to the PBR Viewport, plus GPU and VRAM engine improvements; smoother painting at 4K and the option to paint all PBR maps at the same time; 22 new smart materials, drag and drop workflow with material layers and official support for Windows 10.

Shotgun 6.3 free update

First unveiled at SIGGRAPH, Shotgun 6.3 is out and has received new Media App updates and features, a revamped Client Review Site and Screening Room for RV Submit Tool. Plans are priced according to the support level, starting at $30 per month, for accounts with 'awesome support', or for 'super awesome support' the price is $50.

DID YOU KNOW? The Autodesk Games Reel deadline is 14 December. For info visit area.autodesk.com/gamesubmission2016

Dream of Anhui

Tippett Studio combines its experience in animation with truly immersive filmmaking

Description Tippett Studio was established by animator and visual effects artist Phil Tippett. The studio's credits include the original *RoboCop* and the bugs in *Starship Troopers*. Tippett also provided essential input into *Jurassic Park* and more recently has produced character animation for *Enchanted, Ted, Ted 2, Twilight, Hellboy, Cloverfield* and the TV documentary *Cosmos*.

Website tippett.com

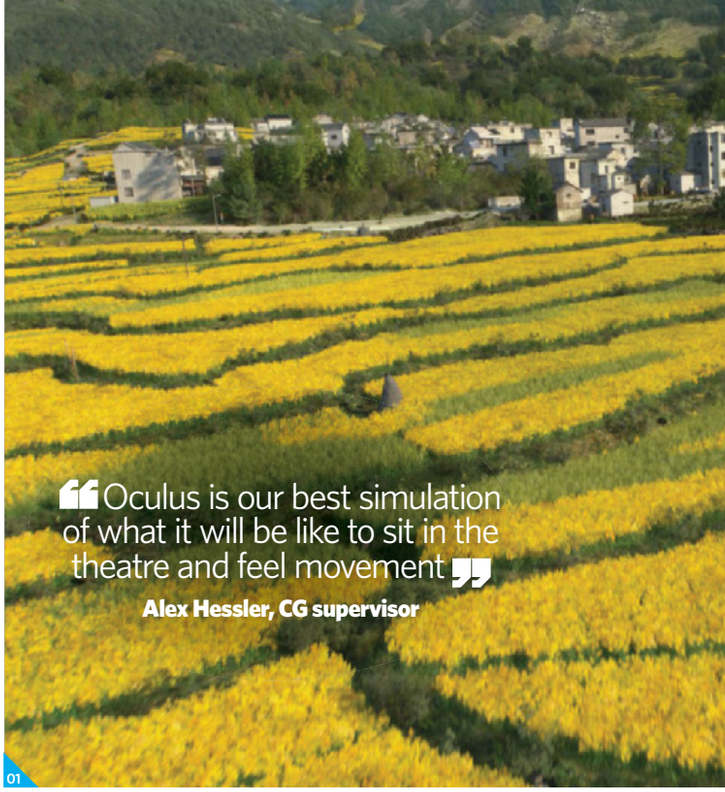
Location USA

Project *Dream of Anhui*

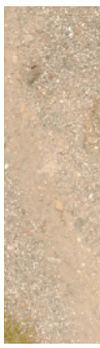
Project description Following the mega success of *Jurassic World*, for which animator and visual effects legend Phil Tippett served as consultant, Tippett Studio is now in the midst of producing an expansive film experience for a Chinese theme park audience.

Studio Tippett Studio

Contributors Alex Hessler (CG supervisor)



01



01 A fish-eye lens view of real-world terrain, suggesting the scope of the images

02 A photogrammetry model for Dream of Anhui

03 For the project, Tippett Studio produced previs sequences

04 Phil reviews material on the dome-shaped screen for a true sense of the 180-degree view

05 Tippett Studio crew deployed a drone to capture a wealth of real-world images as references

We had the chance recently to speak with Alex Hessler, CG supervisor at Tippett Studio working on Dream of Anhui, and he outlined aspects of the work undertaken on the project, identifying some of its challenges and opportunities for the Tippett Studio crew of 20 talented creatives.

Dream of Anhui is a film commissioned for a theme park ride by Chinese cinema-chain Wanda. The ambition of this theme park film is to immerse viewers in the experience of flying over Anhui province, guided by a cast of animated characters, to discover the historic and natural landmarks and wonders associated with the province. In Chinese, the title of the theme park film depicts it as showing a journey of flight over Anhui. Alex describes the guides to the adventure as "A couple of stylised characters and they take you flying over the region." Alex adds that these characters will move in and out of frame to draw the viewers' attention to a particular part of the image.

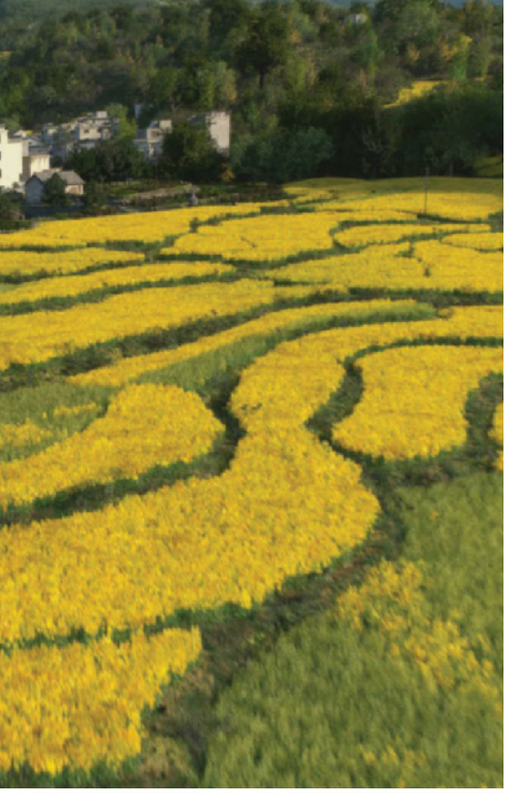
In developing the initial work for the project, previs was an essential stage in the process and Alex notes the use of Maya to develop "a very rough layout that we flew the camera through". From this rough sketch, the studio's artists then used Clarisse iFX software with which to build the digital environments. Of Clarisse iFX, Alex explains that it "excels at huge amounts of geometric complexity. The scale of the environment work is more than any feature film would have." Alex goes on to explain how, for this project, the studio has deployed a fish-eye kind of camera lens that allows for a 180-degree view on a landscape for location filming. The final film will be an entirely CG-realised piece for which the studio has produced 6K renders.

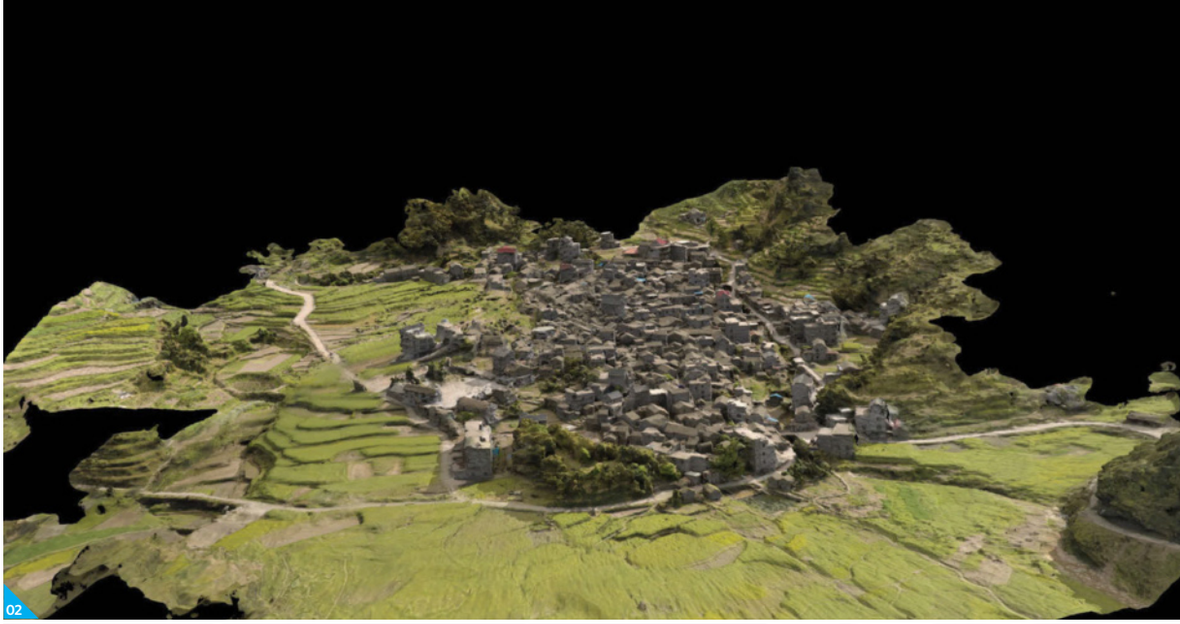
"We have to make everything in CG," Alex explains. "The earliest brainstorming stages started in October/November 2014 and we were in full production in March and April of this year." Rendering of images for the film is scheduled to be completed by the end of this year, with the film having final approval in mid-2016. A key feature of the project's production process has been the use of 4D that, as Alex explains, allows Tippett Studio to "enhance environments that we're flying through". A sense of depth and texture is key to the illusion being created in the film and this will reach down to the tiniest atmospheric details, such as the inclusion of mist to enhance the audience's sense of moving through a waterfall.

Alex goes on to explain how, from start to finish, the project "used Google Earth-type images to get a general sense of where we're going to be and this gave us rough concepts of what we'll have to make. We have a pretty strong advantage in initial concept development. Our biggest challenge is the scale of these environments. Our environment team are the bulk of (the crew)." Alex observes that, on a typical movie, the environment team is a relatively small crew in relation to the rest of the visual effects crew. For the Dream of Anhui, much of the emphasis is on creating the environment as a character in itself. "It's not a conventional story," he tells us.

Maya and MODO have been key tools for work on the project and in tandem with these more familiar packages has been the application of Oculus VR technology at the studio. Alex notes that "We are rendering out the 180-degree view. There's no way to see that undistorted on a normal computer screen." The studio has subsequently found a way to view the 180-degree view images: "We have a small dome (about four foot in diameter) and project the image into it." The Oculus technology allows the crew at Tippett Studio to simulate what the final viewing experience in the cinema at the theme park in China will be like. "Oculus is our best simulation of what it will be like to sit in the theatre and feel movement," Alex explains.

On the subject of the kind of 'virtual' cinema that Dream of Anhui is allowing Tippett Studio to explore, it's clearly not about traditional 'dramatic' storytelling. As such, Alex notes that the project has prompted them to ask "a lot of questions about what genre of entertainment" best suits 'virtual' cinema. Alex adds that the rules and traditions of "basic storytelling" might not apply. In a way, Dream of Anhui offers artists and audiences the chance to get back to the heart and soul of what the first pioneers of moviemaking were concerned with: stunning viewers with images never before seen.





Capturing reality

Early in production, Tippett Studio despatched a small film unit to China to capture images of the terrain that would form much of the heart and soul of the project

The Tippett Studio flew an Iris+ drone provided by 3D Robotics over the relevant locations to record reference images for the subsequent environment and animation work. The material gathered during this process was then manipulated using Agisoft PhotoScan software to re-create the environments so that they could be wrapped around a 3D model of a given location. It was critical to the project that all of the landmarks and terrains were rendered as accurately as they possibly could be. Alex explains that, "We shot footage of each landmark, then used the video feed from the GoPros to drive a photogrammetry program, which then produces a rough geometry that becomes a map for our modellers.

"To help us visualise the dome-shaped immersive screen, we're using the Oculus DK2 and a small-scale hemispherical screen set up here at our studio."

Images of the month

These are the 3D projects that have been awarded 'Image of the week' on 3DArtistOnline.com in the last month

01 unMasked
by Simon Thommes
3DA username Pixelshatter
Simon says: "With unMasked I wanted to express something through inexpressiveness. I wanted to leave room for interpretation while creating realistic materials and shapes. Once more, Blender was used for every step."
We say: *As Simon has explained, by not showing any sort of expression an image can become even more expressive as a result. Lovely textures really stand out in this scene.*

02 BMW I8
by Michael Dominic Sauer
3DA username mds85
Michael says: "This Image of the BMW I8 was completely rendered in Autodesk VRED 2015 Professional without any post-production. For the reflections and lighting, I used HDR Light studio and some local light sources in VRED."
We say: *We really like Michael's product design scene. Product visualisation is harder than it looks, so to put together a coherent concept that also looks pretty is admirable.*

03 Mr Fang
by Diego Sain
3DA username DiegoSain
Diego says: "I created MrFang in order to test my skills in FiberMesh. I love to develop fantasy creatures but always with a realistic mood and special attention to detail. For this type of work, ZBrush, KeyShot and Photoshop are the perfect programs."
We say: *We love Diego's slightly grotesque style – it's very unique. This image in particular really shows off his character design talents.*

04 Autumn Rays
by Saeed Amiri
3DA username Saeed Amiri
Saeed says: "This is my most recent personal project, which I worked on in my spare time. It was initially inspired by Fantastic Frank's WALDSTRASSE 17 project, but I did all my own design and furnishing. Everything in this project is my own asset."
We say: *We're suckers for bright, clean interior arch-vis, and this is a great example of it. Saeed's lighting work is fantastic, and the attention to detail in the furnishings is great.*

01

02

03

04

F1 retro **by Laszlo Peter Kaubek**
3DA username demizson69
Laszlo says: This is a 3D image of the Ligier_SJ21 Formula-1 car from 1983. It's a work in progress. To create the image, I used Maya, mental ray and Photoshop."
We say: *A fine example of hard-surface modelling here from Laszlo, and the light depth of field effects really add to the image's allure. A strong study in working from reference.*

MV Kitchen **by Aspa Rodriguez**
3DA username Aspa Rodriguez
Aspa says: The MV Kitchen project is part of a luxury villa rendering m1tos did for Greek client. We are responsible for the whole concept idea. For this project I used 3ds Max, V-Ray and Photoshop."
We say: *This looks like a very special place to live. We're big fans of the hardwood floors with the cracked paint, and the lighting effects that Aspa has achieved here.*

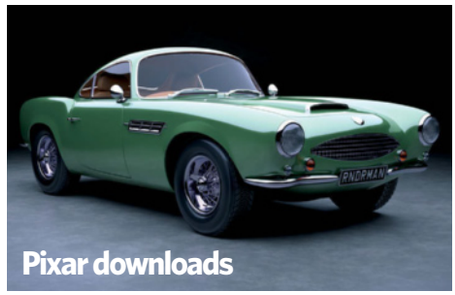
Emotional Building Blocks **by Dieter Coetzee**
3DA username Dieter Coetzee
Dieter says: This is alien merchandise for alien kids. You can create buildings and cities. You have to keep them happy, otherwise they might swear, cry or even bite."
We say: *We can't decide whether these are cute or terrifying! Of particular note here is Dieter's use of colour and the individual textures on each of the models. Good stuff.*

YOUR FREE RESOURCES

Log in to **filesilo.co.uk/3dartist** and download your 3D resources **NOW!**

EVERYTHING YOU NEED TO FOLLOW ALONG WITH THE MAGAZINE AND CREATE GREAT 3D ART

PLURALSIGHT RENDERMAN VIDEOS



THIS MONTH'S COMBINED RESOURCE SIZE: 12GB

filesilo.co.uk/3dartist

YOUR BONUS RESOURCES

ON FILESILO THIS ISSUE, FREE AND EXCLUSIVE FOR 3D ARTIST READERS, YOU'LL FIND OVER 12GB OF RESOURCES, INCLUDING...

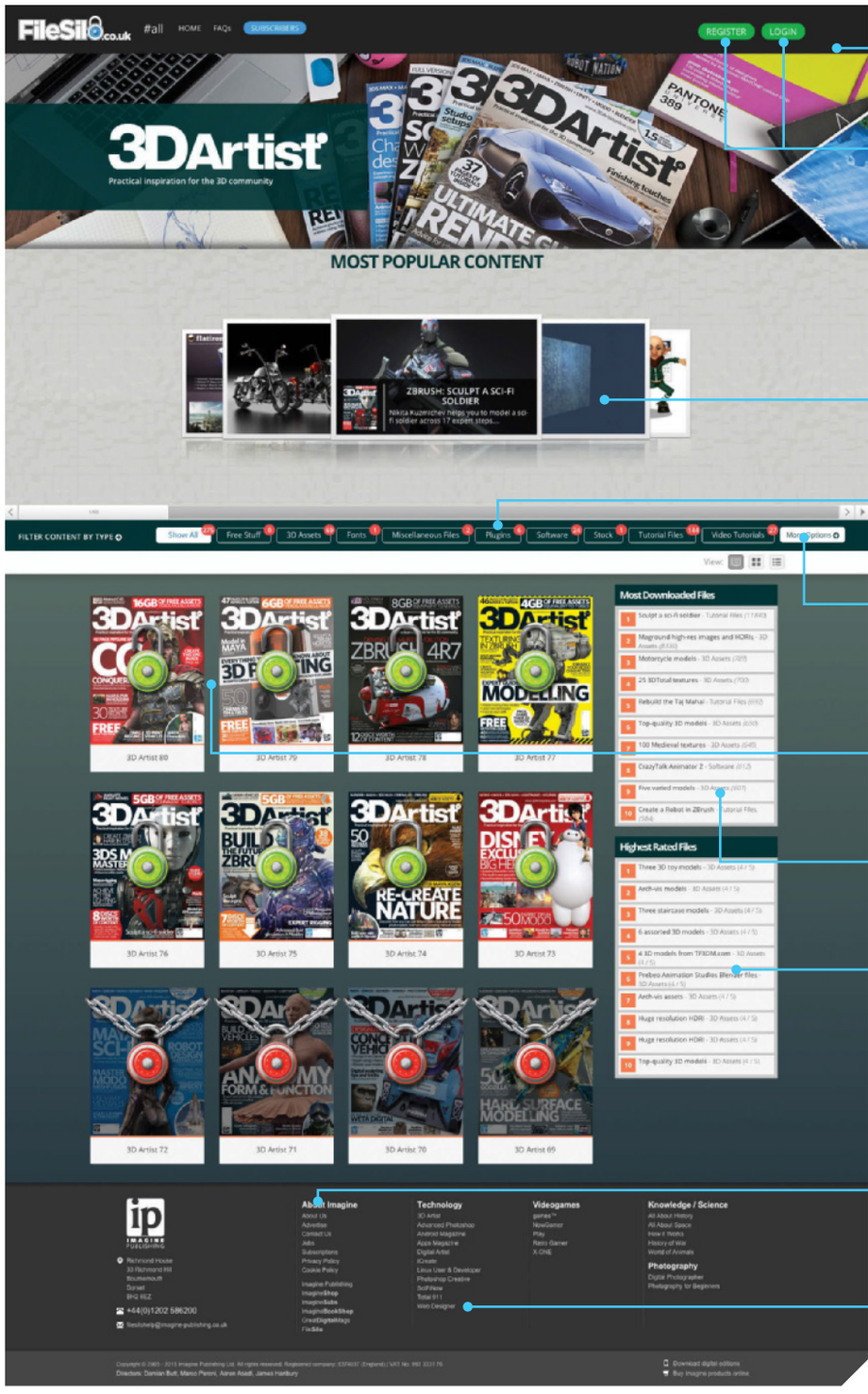
- Over five hours of premium RenderMan video tuition from the experts at Pluralsight Creative (formerly Digital-Tutors)
- Downloadable Maya scene files from Disney Pixar's RenderMan team
- Three enormous HDRI maps courtesy of the guys at CGAxis
- 25 awesome textures from 3DTotal
- A huge selection of images, videos and files from our tutorials

FileSilo

FILESILO – THE HOME OF PRO RESOURCES

Discover your free online assets

- A rapidly growing library
- Updated continually with cool resources
- Lets you keep your downloads organised
- Browse and access your content from anywhere
- No more torn disc pages to ruin your magazines
- No more broken discs
- Print subscribers get all the content
- Digital magazine owners get all the content too!
- Each issue's content is free with your magazine
- Secure online access to your free resources



This is the new FileSilo site that replaces your disc. You'll find it by visiting the link on the following page

The first time you use FileSilo, you'll need to register. After that, you can use your email address and password to log in

The most popular downloads are shown in the carousel here, so check out what your fellow readers are enjoying

If you're looking for a particular type of content, like software or video tutorials, use the filters here to refine your search

Can't find the resource you're looking for in these filters? Click on More Types to specify what kind of resource you want

Green open padlocks show the issues you have accessed. Red closed padlocks show the ones you need to buy or unlock

Top Downloads are listed here, so you can get an instant look at the most popular downloaded content

Check out the Highest Rated list to see the resources that other readers have voted for as the best

Find out more about our online stores, plus useful FAQs such as our cookie and privacy policies and contact details

Discover our fantastic sister magazines and the wealth of content and information that they provide

HOW TO USE FileSilo

EVERYTHING YOU NEED TO KNOW ABOUT ACCESSING YOUR NEW DIGITAL REPOSITORY

To access FileSilo, please visit **filesilo.co.uk/3dartist**

01 Follow the on-screen instructions to create an account with our secure FileSilo system, and then log in and unlock the issue by answering a simple question about the magazine. You can access the content for free with each issue of **3D Artist**.

02 If you happen to be a print subscriber, you can easily unlock all the content by entering your unique Web ID. Your Web ID is the eight-digit alphanumeric code that is printed above your address details on the mailing label of your subscription copies. It can also be found on any renewal letters you receive.

03 You can access FileSilo on any desktop, tablet or smartphone device using any popular browser (such as Safari, Firefox or Google Chrome). However, we recommend that you use a computer to download content, as you may not be able to download files to your phone or tablet.

04 If you have any problems with accessing content on FileSilo, or with the registration process, take a look at the FAQs online or email **filesilohelp@imagine-publishing.co.uk**.

NEED HELP WITH THE TUTORIALS?

Having trouble with any of the techniques in this issue's tutorials? Don't know how to make the best use of your free resources? Want to have your work critiqued by those in the know? Then why not visit the **3D Artist** Facebook page for all your questions, concerns and qualms? There is a friendly community of fellow 3D artists to help you out, as well as regular posts and updates from the magazine team. Like us today and start chatting!

facebook.com/3DArtistMagazine

Issue 89 of **3D Artist** is on sale **30 December 2015** from **GreatDigitalMags.com**

NVIDIA® QUADRO® ACCELERATE YOUR CREATIVITY.

Accelerate your creativity with NVIDIA® Quadro® — the world's most powerful workstation graphics.

Whether you're developing revolutionary products or telling spectacularly vivid visual stories, Quadro gives you the performance to do it brilliantly.

NVIDIA Quadro M6000 VCQM6000-PB	
NVIDIA Quadro M5000 VCQM5000-PB	
NVIDIA Quadro K5000 MAC VCQK5000MAC-PB	
NVIDIA Quadro M4000 VCQM4000-PB	

NVIDIA Quadro K2200 VCQK2200-PB	
NVIDIA Quadro K1200DVI VCQK1200DVI-PB	
NVIDIA Quadro K620 VCQK620-PB	
NVIDIA Quadro K420 VCQK420-PB	

Learn more **www.pny.eu/quadro & pny.quadrok-selector.com**

Insight
uk.insight.com
Tel: 0844 846 3333

Misco
www.misco.co.uk
Tel: 0800 038 8880

Dabs.com
www.dabs.com
Tel: 0870 429 3825

Scan Computers
www.scan.co.uk
Tel: 0871 472 4747

PNY® Professional Solutions

NVIDIA Quadro® / Tesla® / GRID™ / PNY SSD

NVIDIA

© 2014 NVIDIA Corporation. All rights reserved. NVIDIA, the NVIDIA logo, and Quadro are trademarks and/or registered trademarks of NVIDIA Corporation. All company and product names are trademarks or registered trademarks of the respective owners with which they are associated.

THE DIGITAL ANIMATION & VISUAL EFFECTS SCHOOL

DAVE SCHOOL

www.daveschool.com

MALUSI TUGWANA
2015 GRADUATE

"If I've learned anything from The Dave School, it would be the value of hard work, determination and the importance of having a strong passion for doing something you love. At the end of the day, coming to The DAVE School was one of the best decisions I've made in my life and I would implore any other aspiring 3D Artist to do the same."

ACADEMIC PARTNER

TO SPEAK WITH ADMISSIONS OR TO SCHEDULE A TOUR, PLEASE **CALL (855)328-3839**
THE DAVE SCHOOL IS LOCATED ON THE BACK LOT OF **UNIVERSAL STUDIOS FLORIDA®** IN ORLANDO.

THE DAVE SCHOOL IS NOT OPERATED BY NOR AFFILIATED WITH UNIVERSAL ORLANDO®